THE IDEA OF DEVELOPMENT

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BY

REV. P. M. NORTHCOTE

AUTHOR OF "THOUGHTS OF THE HEART," "CONSOLAMINI," ETC.

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TO THE

ADORABLE CREATOR,

WHO FOUNDED AND GOVERNS ALL THINGS,

IN LOWLIEST HOMAGE I DEDICATE

THIS BOOK.

PREFACE

WHOSOEVER departs from scholastic principles undermines reason and imperils faith. These principles will remain for ever unmoved, because they are founded in Nature ; they constitute the imperishable basis of that relation which exists between the human intelligence and the things that are. Nevertheless, they are principles, not ultimate conclusions. Wherefore Leo XIII., in his encyclical "Æterni Patris," while he warns us that it is both futile and dangerous to attempt "patrimonio antiquæs apientiæ posthabito, nova moliri," yet encourages us "vetera novis augere et perficere." When, then, any more or less new conception is presented to us, it is the part of the judicious philosopher not to reject it out of hand, but to examine it in the light of scholastic principles, and to see how far it is compatible and how far incompatible with them. It is in the light of these principles that I have here endeavoured to treat of the theory of Evolution. By Evolution I understand a process governed by three laws—Variation, Selection, and Heredity. Yet the whole is hypothetical, and as such I treat it. I must ask

the reader to bear this in mind, or otherwise he will be himself confused, and will be likely to accuse me of inconsistency. There is, however, no inconsistency in pleading sometimes for and sometimes against an hypothesis, for both sides may or may not be true. I have therefore taken up no positive standing-ground with regard to Evolution. My attitude is that of the open mind. I find in it nothing that contradicts the principles of my philosophy, and consequently I am ready to accept as much as facts can prove and faith will permit.*

I must not omit to record the debt of gratitude I owe to Dr. Andrew O'Loughlin, D.D., Ph.D., for the invaluable assistance he has rendered me in getting this essay into a presentable shape.

P. M. NORTHCOTE.

* Facts and faith can never be really at variance, but they may appear to be so for a time.

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I

At the present time the tide of scientific opinion has set strongly against the theory of evolution as it was propounded by Darwin. Of this theory he himself admits that it can be met with difficulties of the gravest import; and he shows himself a true appreciator of the necessity of sound induction where he says, in his Introduction to "The Origin of Species":

"I am well aware that scarcely a single point is discussed in this volume on which facts cannot be adduced, often apparently leading to conclusions directly opposite to those at which I have arrived. A fair result can be obtained only by fully stating and balancing the facts and arguments on both sides of each question, and this cannot possibly be here done."

From this quotation it is evident that he does not claim for his theory anything more than probability.

It is not here my intention, as it is outside my sphere, to discuss the merits or demerits of evolution considered in itself. This, indeed, would be a difficult matter in the present haziness of conception as to what we really mean by the term "evolu-

tion." I have thought, however, that it might not be devoid of interest to inquire how far the idea of development enters into the philosophy of the scholastics, and in what it may be said to resemble modern notions about evolution. It is this aspect of the question which I propose briefly to set forth in the present essay.

The theory of evolution is necessarily based on facts, and consequently, until the facts which tell against it have received a really sufficient explanation, it must remain a mere hypothesis of greater or less probability. But as regards the principles used in constructing this theory, these are all to be found in scholasticism—that philosophy which is, and must remain, perennially true, because, although not all its conclusions either are, or pretend to be, the last possible word on the subjects brought under consideration, yet its principles are for the most part immutably fixed in the nature of things, and therefore render it in any essential the philosophy of all time. As Newman expresses it in his "Idea of a University" (Discourse V.):

"While the world lasts will Aristotle's doctrine on these matters last, for he is the oracle of Nature and of Truth. While we are men we cannot help to a great extent being Aristotelians, for the great master does but analyze the thoughts, feelings, views, and opinions of human kind. He has told us the meaning of our own words and ideas before we were born. In many subject-matters to think correctly

is to think like Aristotle, and we are his disciples whether we will or no, though we may not know it."

From amongst the followers of Aristotle, I shall, in the main, appeal to St. Thomas Aquinas, seeing that he is the greatest and most representative of the scholastics.

The Darwinian theory consists in this—that all forms of organic life, not excluding man himself, have been evolved through countless ages from the very lowest form or forms of life, the great factor in this process being "natural selection." This process, according to the theory, is still going on, and will go on to an indefinite period. How life first originated is a question which Darwin leaves almost untouched. He speaks of "life, with its several powers, having been originally breathed by the Creator into a few forms or into one" ("Origin of Species," Conclusion). Further than this he makes no attempt to solve the momentous question.

These, then, are the main outlines of the theory. But to judge of any philosophy, the first thing we have to do is to look at its principles, for upon certain principles, true or false, all reasoning is based. We may draw erroneous conclusions from true principles through some defect in the reasoning, we may even draw true conclusions from false or doubtful principles by slurring over the gaps in our process; but if we would reason accurately, we must legitimately deduce conclusions from sound and sure

principles, or, if we like to use doubtful ones, we must not claim for their offspring anything higher than probability. There are some persons who make light of logic simply because they do not understand it. You might as well expect to be able to build a bridge without mathematics as expect to produce any work of reason without logic, for logic is the art or science which teaches us how rightly to use our reasoning powers, so that, avoiding error, we may attain truth.

Darwin was first profoundly impressed—as, indeed, all observers must be—with the steady, almost imperceptible, gradation in living forms from the lowest to the highest. It is, indeed, apparent that from the lowest form of vegetable life to the highest form of animal life the gradations slip one into another in a constantly ascending scale till we reach the apex, man. The bodily organization of different forms slowly mounts up from the most rudimentary simplicity to the most complex perfection.

In the same way, as regards the powers of perception, we begin with the unconscious affinities and repulsions of the lowest forms of vegetable life, and again we ascend by imperceptible gradations till we come to the wonderful instincts exhibited by many animals and even insects. Darwin says that there is an immense distance between the mental powers of the lowest savages compared even with the most sagacious brutes, but he holds that the difference is

a difference of degree, not of kind. I have shown, in three essays published by the Catholic Truth Society (" Reason and Instinct," " The Powers and Origin of the Soul," and " The Use of Reason "), that the difference is truly essential, not merely a question of degree. Yet I agree with Father Clarke (" Logic," part i., ch. vi.) that there is so great a *primâ facie* similarity between the " common phantasm " and the " idea " or " concept " that it requires a trained metaphysician to distinguish between the two, and unless we have this distinction clearly before our minds, we cannot hope to be able to discern the fundamental difference 'twixt Reason and Instinct.*

We may therefore look upon " gradation " as the starting-point of Darwin's theory. But did this pass unnoticed by those medieval philosophers whom we term the schoolmen? By no means. The adage, " Natura non facit saltum," which Darwin quotes, was quite an established principle with the old naturalists. Aquinas draws out the sense of this adage in Qq. Disspp., " De Ver.," q. XV., a.l.c., where he expresses it thus : " Inferior natura in suo summo attingit ad aliquid infimum superioris naturæ "—a saying which became compressed into the epigrammatical utterance : " Supremum infimi attingit infimum supremi " (The highest of the lowest touches the lowest of the highest). He

* See Appendix.

exemplifies his meaning in the same place, where he goes on to explain that what belongs to the higher nature cannot be perfectly in the lower, but only by a certain feeble participation, just as reason is not contained in sensitive nature, but a kind of participation of reason, inasmuch as the brute animals have a certain natural prudence (or, as we should say, " sagacity ").

It is, therefore, abundantly clear that the scholastics paid great attention to that fact which serves as the foundation-stone of evolution—namely, the gradually ascending scale in the perfection of material created existence which we see around us. Indeed, St. Thomas makes use of " gradation " as a proof of the existence of one supremely perfect entity, approximation to which is the measure of created excellence. He even goes so far as to draw from this law of gradation a probable argument for the existence of purely spiritual forms, more perfect in their nature than the human soul, yet infinitely distant from the limitless perfection of that supreme and necessary Existence whence all created being is derived. Wherefore he concludes that above us are again the angelic spirits, themselves graduating upwards in an almost endless scale of greater and greater perfection as they participate more and more fully in the likeness of the uncreated and absolute Deity.

If to what we have already taken from the scholastics about the gradation in created things we

add the principle, " Ab extremo ad extremum non datur transitus nisi per medium " (From extreme to extreme there is no passage, except through the mean), we shall have got together enough building material in the way of principles to construct any theory of evolution which can be supported by ascertained facts. Evolution depends on facts; nor are we justified in carrying our theory of evolution to greater lengths than facts will allow. It is true that the attention paid to the inductive sciences in modern times has put us in possession of a vast body of facts which were unknown to the medieval philosophers, but if we are to believe a large and ever-increasing number of the best authorities of to-day, these facts are not in favour of, but rather tell against, the supposition of the evolution of a higher species from a lower. Still, the evolutionistic potentialities contained in scholastic principles are almost limitless. It matters nothing that the scholastics had no clear conception of these possible conclusions. A far closer study of facts than lay in their power was requisite before anyone could formulate a theory of evolution such as we have seen formulated. But this is in no wise derogatory to them, for the intellect must be indeed angelic that can see all the possible conclusions resulting from given principles. The argument *a priori* so often urged against evolution, taken from the principle, " Natura non potest ferri supra seipsam "

(Nature cannot exceed herself), does not appear to me at all conclusive against the theory of evolution; for, to use the language of logicians, it is possible to distinguish the major proposition, and consequently the conclusion extends farther than the premisses will allow. Indeed, there is no greater difficulty in conceiving the evolution of species one from another under the influence of a Supreme Evolver than there is in recognizing the development of the embryo under the actuation of the created fecundator. It is not new creation; it is the calling out of potentialities into actual being. And we shall see later on that St. Augustine, with his "rationes seminales," has hinted at this as a possible theory to account for the action of the Supreme Cause in the origin of created things. The difficulties against evolution are not so much *a priori* as they are *a posteriori*. The question is a question of fact, and until facts have been more multiplied and better sifted, we shall not know the rights and wrongs of the different theories of evolution.

Let us now glance at the second step in the mental process which led Darwin onwards to his final conclusion. This was the marvellous variety which can be brought about by man's ingenuity in the development of different types under domestication. For a full appreciation of man's dominion over Nature in this particular respect I must refer the reader to Darwin's own works. His grasp of

the subject is prodigious. He arrays before the mind's eye plants, birds, and beasts as we have them now, showing how a few wild types have been worked up into such an enormous number of different varieties to serve man's uses and pleasures. Pondering this, he perceived that three principal factors were at work to account for these surprising modifications: (1) Spontaneous variation of type, upon which man seizes by (2) artificial selection, and which is rendered relatively stable and permanent by (3) the power of heredity.

Having seen that variation and the power to transmit by heredity are inherent in Nature, it struck Darwin that there might also be in Nature a power corresponding to the "artificial selection" of man's agency to account for the production of the numberless forms of material life we see around us. It was thus that Darwin was led to excogitate his theory of "natural selection," by which Nature, ever watchful for the welfare of her offspring, selects and renders stable by heredity any variation tending towards the creature's benefit, or rejects and stamps out what is useless or detrimental. Thus a slightly new type is formed, which in process of time will dominate and finally even wipe out of existence the parent form, in which the peculiar excellence imparted by this new variation was wanting.

As he points out, there is a constant struggle going on upon this globe amongst all creatures to

maintain themselves in existence, whether as regards the individual* or as regards the species; consequently, that type in any species which possesses some advantage will eventually gain the victory and exterminate its competitors, and thus new varieties and eventually new species are formed. He maintains that the process is inconceivably slow, but sure as slow.

Upon the theory of "natural selection" the evolution of Darwin rests. It is the very corner-stone of his hypothesis, on which Darwinism pure and simple must either stand or fall.

Let us now briefly examine "natural selection," and see if the principles from which it results are to be found in scholastic philosophy. These principles are:

1. The struggle amongst creatures to maintain themselves in existence.
2. Spontaneous variation.
3. The influence of heredity.

As regards the first of these principles—*i.e.*, "the struggle for existence"—this arises, as Darwin points out, from the prodigal fertility of Nature, which produces life in a measure vastly in excess of the limitations of habitat and food-supply; consequently, all living forms are engaged with one another

* This did not escape the notice of the scholastics, for Scotus has (*supra* xii., Metaphys., q. xxvii.) "Præsertim in genere sensibilium unum alteri est interitui" (Especially amongst things sensible one is set for the destruction of another).

in a silent but deadly warfare to maintain their place. In this struggle the best-equipped must ultimately prevail, and the weaker must in time go under and be stamped out.

Let us see if there be anything corresponding to this principle in the teaching of the scholastics. In the first place, we have the well-known axiom, "Quælibet res naturaliter conservat se in esse, et corrumpentibus resistit quantum potest" (Everything naturally preserves itself in being, and resists as far as it can destroying influences) (2-2, LXIV., 5c.).

This is the acknowledged law of self-preservation. This law of self-preservation holds good not only with regard to the individual, but even more so with regard to the species: for, as we learn from St. Thomas, in corruptible things the principal aim of Nature is the preservation of species. "Bonum speciei est de principali intentione naturæ" (The good of the species is the principal intention of Nature) (1ª, XCVIII. 1). He says, by way of explanation, that Nature intends what is perpetual, and therefore, since individuals pass away and species remain, it follows that Nature has a greater care for the species than for the individual.*

This principle goes a long way towards establish-

* For further elucidations of the principle, "Intentio Naturæ est ad speciem" (The intention of Nature is towards the species), see "De Veritate," q. III., a. 8 c.; "Summa," l. LXXXV., a. 3, ad 1um Qq. Disspp. q. un; "De An," a. XVIII. c.

ing—at least, in a modified form—Darwin's doctrine of "natural selection." In fact, natural selection of some kind follows almost inevitably, once we become aware of the fact that the earth produces life vastly in excess of her capacity to sustain it, and that consequently, between individuals, races, and species, there is ever going on a tense and deadly struggle for existence, in which struggle the best-equipped will ultimately prevail.

Now, as regards the equipment of different races and species for the struggle, this, as we have seen, depends, according to Darwin, upon (*a*) spontaneous variations seized upon by (*b*) natural selection, and rendered stable by (*c*) heredity.

If we look at these three points one by one in the light of scholastic principles, we perceive, with regard to (*a*), that nothing was better known to the schoolmen than the fact of individual variations; indeed, the very notion of an individual amongst corporeal beings included "materia individualis cum accidentibus omnibus individuantibus" (individual matter with all its individual characteristics) (1ª III. 3). Of these individual characteristics, some are inborn, others are subsequently acquired. St. Thomas, in his deep and difficult treatise "De Habitibus," discourses on the acquisition of habits by repeated acts, and of their loss by the discontinuance of those acts: in this he at least touches upon Darwin's teaching about the effects of use and disuse.

Furthermore, St. Thomas, following the footsteps of St. Augustine, allows to the brute animals in a state of domestication the formation of habits impressed upon their sensitive nature by repeated acts (1-2, L. 3, ad 2um). But he does not admit it as applying to the formation and development of their natural powers. We must, however, allow that creatures in a state of nature do sometimes acquire new habits, as, for example, the Kea parrot of New Zealand, which from fruit-eater has become a flesh-eater. Darwin labours at the proof of this with his wonted skill in the seventh chapter of " The Origin of Species."

Now, proceeding to our second point, (*b*). In addition to what I have already said about natural selection, it may be noticed by way of further elucidation, that, as regards Nature's selective power, scholasticism has a principle that " Natura est entis amans " (Nature loves entity)—that is to say, she loves a perfection, and hates an imperfection ; or, according to another similar axiom, " Natura semper facit melius quod potest " (Nature always does the best she is able), which Aquinas explains (Qq. Dispp. " De Pot.," q. III., a. 6 ad 26), saying that Nature, in her own order, and with regard to the right economy of the universe, always seeks what is best ; she will seize upon a perfection and fly an imperfection wheresoever the chance is offered her. And since each unit in the species, and each several species, is seeking its own conservation in being, and its own

peculiar perfection, it would seem that there almost necessarily follows a struggle for existence and the survival of the fittest. When Darwin says ("Origin of Species," c. iv.), "Natural selection cannot possibly produce any modification in any one species exclusively for the good of another species," he is but echoing the words of Aquinas (1ª, LXV. 2): "In partibus universi unaquæque creatura est propter suum proprium actum et perfectionem" (In the parts of the universe every creature exists for its own act and perfection). We may here say, by way of parenthesis, that the office of natural selection, in so far as it exists at all, is not to *produce* modifications, but merely to seal them with its approbation. I am not contending that the scholastics definitely applied these principles to the law of natural selection; I only say they are applicable to it in so far as such a law can be established by the observation of facts.

As to our third point, (*c*), the transmission of variations by heredity, the scholastics have a well-known principle—"Simile producit sibi simile" (Like produces like)—which was held to be true, not only of specifical identity—namely, that an individual of a species generates another of the same species—but, furthermore, that even individual characteristics, unless they are purely personal, may be transmitted by the generative force. Thus, St. Thomas says (1-2, LXXXI. 2):

" Si natura sit fortis, etiam aliqua accidentia individualia propagantur in filiis, pertinentia ad dispositionem naturæ, sicut velocitas corporis, bonitas ingenii, et alia hujusmodi " (If nature be vigorous, even some individual characteristics belonging to natural disposition may be transmitted to the offspring, such as fleetness of foot, mental acuteness, and things of this kind).

At this point Darwin comes in with his law of " Sexual Selection," for a full exposition of which I must refer the reader to the " Descent of Man." But the schoolmen have also a principle very analogous to this, which may be developed as follows :

If in a male and female have simultaneously appeared some profitable variation, then, according to scholastic principles, the tendency in Nature will be that if they meet they will unite, for " Simile appetit simile " (Like seeks like). Thus, there will be a good chance that the profitable variation will be transmitted to posterity. If this process goes on for countless generations, it is difficult to place any limit to the variations which may be effected : the scholastics, however, place a certain limitation by the principle, " Natura non potest ferri supra seipsum " (Nature cannot exceed herself), which we must perforce recognize as true, because it is an immediate application of the first principle that " an effect must be proportioned to its cause," but within the confines of the sphere in which a thing exists its possible variations seem almost limitless.

However, as I have noted above, this principle does not of necessity exclude the evolution of species from species, for where instrumentality is possible the supreme agent may make use of the lower for the production of the higher. But it would be impossible that an immaterial substance should be evolved from matter, for, as I explained in " The Powers and Origin of the Soul," the production of an immaterial substance implies an act of sheer creation, for which no instrumentality is possible. The weak point in the theory of genetic evolution is not that it transgresses any inconcussible principle of sound philosophy, but that it cannot be satisfactorily squared with the facts of nature.

We have now reviewed the principles forming the basis of Darwinism, which are summed up by Darwin himself in these words :

" These laws, taken in the largest sense, being Growth with Reproduction ; Inheritance, which is almost implied by Reproduction ; Variability, from the indirect and direct action of the external conditions of life, and from use and disuse ; a Ratio of increase, so high as to lead to a struggle for life, and, as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less improved forms " (" The Origin of Species," Conclusion).

We have seen, moreover, that for each of these principles we are able to cite a corresponding principle from scholastic philosophy. I do not, of course,

mean to say that the schoolmen worked out Darwin's conclusions from these principles. I am not dealing with conclusions, but with principles; for just as harmony is the soul of music, just as brevity is the soul of wit, so are principles the heart and soul of every philosophy. We must not expect to find Darwin's inferences in the works of the scholastics. We do, however, undoubtedly find in them the principles upon which these inferences rest. Take, for instance, the scholastic principle so clearly expressed by St. Thomas (2-2, I. 7, ad 3*um*): "Secundum ordinem causæ materialis prius est quod est imperfectius; et secundum hoc natura procedit ab imperfecto ad perfectum" (In the material order first comes that which is less perfect; and, according to this, Nature proceeds from the imperfect to the perfect). Perhaps even still more to the point is the axiom, "Generatione posteriora sunt priora perfectione" (What are posterior in generation are prior in perfection), which St. Thomas explains (in Lib. III., "Sent. Dist.," XXVII., q. 1. a. 4 ad 2*um*, and elsewhere) by reference to the development of the individual; but this same principle applied to the species, and not only to the individual, would produce "evolution."

We have, however, certain evidence that Aristotle, and from him St. Thomas Aquinas, had grasped and repudiated the atheistic evolution of the old Greek naturalists. For the opinions of our modern

materialists are identical in their general drift with those of the materialists of ancient Greece : these also denied a Providence and the existence of any finality in the designs of Nature ; they considered everything as the outcome of " iron mechanical laws," and, like our moderns, what they could not explain, for want of a better name they called the result of " chance." St. Thomas elucidates Aristotle's summary outline of their position in " Phys., II., Lect. xii." : they argue that rain is not a providential contrivance for the fertilization of the earth, saying that whereas it is usually beneficial to the crops, it is sometimes destructive of them; they contend, therefore, that the phenomenon of rain is purely the result of an " iron mechanical law " uncontrolled by a Supreme Intelligence. The particles of water, being rarified by the sun's heat, ascend until they come to a part of the atmosphere where the sun's rays no longer have the same power to give heat on account of the distance from the surface of the earth, whence they are rebutted ; thus, being once again condensed by the coldness of the temperature, they fall to the earth by their gravity. So, they say, it is merely a matter of chance whether the rain does good or harm ; thus they endeavour to controvert the notion of an overruling and beneficent Providence, and of any design in the operations of Nature. The reader will acknowledge that the science of these ancient materialists is excellent as

far as it goes. But St. Thomas points out that their example in this instance is wholly inconclusive for their contention, because they are bringing into comparison a particular effect with an universal cause. We may well doubt the existence of a designing and over-ruling Providence if we narrow down our considerations to some particular effect ; we must try to enlarge our vision so as to take in as much as possible of the whole scheme. A pestilence may be harmful to a particular family by depriving it of its breadwinner, but it may be beneficial on the whole by easing the congestion of an over-populated district.

Nevertheless, the materialists of ancient Greece made use of this example in their reasonings, and from it they went on further to argue : May it not be the same with the organs of the body, which appear to be constructed for a designed purpose—as, for example, the incisor teeth are sharp, apt for biting one's food ; and the molar teeth broad and blunt, apt for masticating it when bitten ? Such a thing, they say, appears to teleologists to be the outcome of design, whereas there is no reason for supposing it to be other than the result of blind material causes which so happened to fashion the teeth.

The answer of these old-world materialists to their adversaries the teleologists, who contended that, since the organs of the body were just exactly fitted for the uses made of them, therefore they could not be otherwise than the result of design, is most

remarkable. They said that in the first institution of things (which some attributed to the action of Intelligence) the combinations of the four elements produced all sorts of forms, some of which were useful, and some not. The useful forms *survived because they were fit to survive* (" Illa conservata sunt, eo quod habuerunt talem dispositionem aptam ad conservationem "), while the useless forms were stamped out, and are being continually stamped out (" Quæcumque vero non habuerunt talem dispositionem, sunt destructa, et quotidie destruuntur ").

Whosoever thinks that the notion of " the survival of the fittest " is an entirely modern creation had better read Aristotle and St. Thomas's commentary thereon in " Phys., II., Lect. xii."

In Lecture xiii. St. Thomas skilfully draws out Aristotle's five arguments to prove that there is design in Nature; these, however, I omit, as being outside the scope of this essay, and content myself with having shown that the outlines of atheistic evolution were perfectly familiar to the ancient Greeks.

Though it is an established principle of scholastic philosophy that Nature proceeds from the imperfect to the perfect—and this, indeed, at least, as regards individual or racial development, is beyond all question—yet the unassailable claims of the action of the First Cause are safeguarded by the, at first sight, apparently contradictory principle, " Perfectum præcedit imperfectum " (The perfect precedes

the imperfect). The contradiction is only apparent, not real, for although, as Aquinas explains (3*a* I. 5, ad 3*um et alibi*), as regards the process of generation, the perfect originates in the imperfect, nevertheless, there must of necessity pre-exist a perfect efficient First Cause, guiding the imperfect to its destined perfection. We shall touch on this principle later on, which anyone with the smallest pretensions to a knowledge of metaphysics must at once recognize as an incontestable truth.

Although St. Thomas does not expressly state as an opinion that one species may have been evolved from another, such a notion may nevertheless have crossed his mind, and we sometimes fancy, reading through the lines, that the boldness of this conception startled him, and his humility caused him to draw back when he was on the very brink of laying it down as a possible solution of that great mystery of Nature, " the Origin of Species." In his endeavour to reconcile the words of Genesis, that God rested from the work of creation on the seventh day, with the fact that creation—at least, as regards individual human souls—goes on every day, it seems to have struck him that even as regards species this work may still be going on, and that the words of Genesis merely imply that God had finished laying down the broad lines of creation, and that thenceforward He left the multitudinous energies implanted in Nature to fulfil their allotted course under the guiding hand of His

all-embracing Providence. Aquinas expresses himself thus (1*a* LXXIII., 1. ad 3) :

" Species etiam novæ, si quæ apparent," etc. (Even new species, if any such appear, pre-existed in certain active energies, just as animals generated from putrefaction are produced by the energies of the stars and elements, which they received in the beginning, though new species of such animals are produced. Some new species of animals also arise from the intercrossing of animals of a different species, as the mule is generated from the ass and the horse ; and these also pre-existed virtually (" causliter ") in the works of the six days).

From these words it is evident St. Thomas considers that new species actually do arise, for he quotes as examples the creatures generated in putrefaction, which he erroneously supposed to be due to the actuating properties of the heavenly bodies ; he quotes also hybrid animals as forming new species ; he seems to have overlooked the fact of the sterility of hybrids—a point concerning which more anon. From these examples he conjectures that new species of one kind and another may perhaps arise in process of time, and that it is not absolutely necessary to suppose that they were rendered fixed, permanent, and unalterable in their first creation. There are, of course, manifest crudities in his reasoning on this subject—that is not to be wondered at—but what I wish to draw attention to is that he appears at least to have guessed at a process of evolution in the production of the species.

The evolution of Aquinas, such as it is, was derived by him from the daring speculations of the great St. Augustine, a soaring intellect, whose bold and original conception of creation strikes out a line of its own, unsupported by any of the illustrious Christian writers who had gone before him. It seems to us that St. Thomas has incorporated the notions of the Bishop of Hippo into his theology, not without some misgivings ; he appears rather inclined to explain away than to fully endorse the opinions of the great light of the African Church. I do not mean to insinuate that St. Thomas was a timid thinker—far from it ; nevertheless, he has in him a deep vein of caution, and he appears, if I may be allowed to read through the letter into the mind of the Angelic Doctor, to be at one moment strongly drawn to the teaching of Augustine, and the next moment his natural wariness causes him to recoil from the bold speculations which, unless handled with the utmost delicacy, might prove subversive of some of his cherished peripatetic principles. The alarm—if, indeed, it existed in the mind of St. Thomas—was wholly needless ; for " evolution " proved up to the hilt would not upset a single peripatetic principle of any importance. We have seen, as I have indicated above, that a metaphysical necessity postulates the creation of each individual human soul, but such is not the case with the human body, that is produced by generation. Why, then,

should not the first human body have been produced by " evolution " ? There is no *a priori* impossibility in this. None the less, St. Thomas is evidently shy of the teaching of St. Augustine on this point. In 1*a* XC., 4. c. he has :

" Augustinus vero in 7 super Gen. ad litt., c. 24. dicit quod anima hominis ante corpus cum Angelis est creata, ob aliam rationem," etc. (Augustine, however (in 7 super Gen. ad litt., c. 24), says that the soul of the first man was created before the body, at the same time with the Angels, for another reason (from that of Origen)—namely, because his position is that the body of the first man was not actually produced in the works of the six days, but only *virtually*, which cannot be said of the soul, since it was not made of any pre-existing matter, corporal or spiritual,* nor could it be produced by any created power. And therefore it seems (to him) that the soul itself was created, together with the angels, in the works of the six days, during which all things were made, and that afterwards, by its own will, it was inclined to the administration of a body. But this he does not say assertively, as his words show ; for he says (*loco citato*, c. 29), " It may be held, if contradicted by no authority of Scripture or reasonable truth, that man was so made on the sixth day that the human body lay virtually in the elements of matter, while the soul was then and there created ").†

* " Spiritual matter " sounds, and is, a contradiction. Nevertheless, amongst the ancient writers an opinion had vogue that there was a sort of quasi-spiritual matter, out of which angels and souls were made.

† It is difficult to translate the Latin of these excerpts in a manner that is faithful to the original, and at the

To exemplify over again St. Thomas's apparent suspicion of the doctrine of St. Augustine in this matter, I quote 1*a* XCI., 2 ad 4 :

" Ad quartum dicendum quod secundum rationes causales in creaturis dicitur aliquid præexistere dupliciter," etc. (To the fourth question it may be replied that a thing may be said to pre-exist virtually in created nature in two ways—in one sense according to both active and passive power, so that not only is it capable of being fashioned out of pre-existing matter, but also that there pre-exists some creature that is able to accomplish it ; in another sense only according to passive power—namely, that it can be fashioned by God from pre-existing matter. It is this latter sense that Augustine intends).

It is, I admit, difficult to get a clear conception of St. Thomas's meaning on this point. His article (1*a* XCI., 2) treats of the formation of the body of the *first* man, so that from the outset any question of the agency of a human parent is excluded ; then, in the body of the article, he proceeds to exclude angelic agency, against the position of some who held that in the formation of the first human body the Creator made use of angelic intervention. Finally, in his reply to the fourth question, he

same time is not quite barbarous English, but I have done the best I can with it, attending more to the sense than the letter. Perhaps the aptest rendering of " causales rationes " or " seminales rationes," which St. Thomas uses pretty well indiscriminately, would be " natural forces," or " latent energies," or something of this kind.

appears to me to exclude any latent energy or " vis formativa " implanted originally in matter, so that there is no position left but to fall back upon sheer passivity — namely, the passive potentiality of matter to be formed into the organism of the human body. For if we compare what he here says about " potentia activa et passiva " with his use of the same expression in 1*a* XCII., 1, one can hardly doubt that by " potentia passiva " he intends the sheer passive capability in matter of being fashioned into a living organic body of some kind, and by " potentia activa " he understands the " vis formativa " of the male element. It is true, as I have said, that his words are capable of another interpretation, but for my own part I find this interpretation too subtle and far-fetched. It is only, however, in the case of the formation of the human body that St. Thomas whittles down the doctrine of St. Augustine about " seminales rationes " to so low a status as that of merely passive power, no doubt on account of the excellence of the human body, which was formed to be the instrument of an immaterial soul. In the case of other organic bodies, as far as I can see, he allows, even if he does not definitely adopt the view, that these " seminales rationes " are active energies.

I think it is evident that in writing this article, or, at least, in his answer to the fourth *quæsitum*, St. Thomas had in mind the doctrine of St. Augustine (" De Trin.," III., c. 8) about the production

of the frogs by the Egyptian priests through diabolical agency in their contest with Moses. St. Augustine teaches that God implanted in matter certain vital energies which, if rightly applied, would produce a living body. He even holds that the vital energies required for the formation of a human body lay thus dormant in matter. St. Thomas feels that if this is allowed, then there is no reason for excluding angelic agency in the formation of the first human body any more than in the formation of frogs or other inferior creatures. Wherefore, in his anxiety to preclude this possibility without altogether impugning the doctrine of the greatest of the Fathers, he sees no other way of obviating the difficulty than by reducing in this instance St. Augustine's vital energies ("seminales rationes") to passive power pure and simple.

Aquinas has here been proposing to himself, and solving according to his own way of thinking, the opinion of St. Augustine that in the six days of creation God implanted in matter the power to produce the human body, but did not actually evoke that body from the matter in which it potentially lay. He seems to hold that Augustine speaks merely of passive power—the capability, namely, in matter to receive the form of the human body. Those who are conversant with the terminology of scholastic philosophy will perceive that his words may be taken in a wider sense. They do not necessarily exclude the existence of created energies latent in matter,

which are capable of evolving in time the human body. He does contend, however, that no created power, not even that of an angel, could evoke those energies and direct them to so high an end, but that for this would be required nothing short of the immediate action of the First Cause. St. Thomas's words, which I shall quote later on, make it quite clear that he held material organisms inferior to the human frame to be the product of these latent energies implanted in matter by the Creator, but he seems uncertain whether this would apply to the formation of the human body.

Now that we have seen human bodies, it would be a truism too obvious to be worthy of notice from such a man as St. Augustine that matter is passively capable of receiving the human form, and if I quote a few extracts from his writings, I think it will be abundantly clear that his meaning was that the Creator implanted in matter active energies capable of evolving a body fitted to receive the immaterial form of the human soul as its actuating principle.

In " De Trin.," III., c. 16, Augustine thus expresses himself :

" Aliud est enim," etc. (It is one thing to found and order the creature from that most intimate and supreme pivot of all causes, and he who does this is God the Creator alone ; but it is another thing to bring about some operation by applying those *energies and powers* conferred by Him, so that what is created comes forth at this time or at that, in this manner or in that manner. All these things, for-

sooth, have been already originally and primordially created in the composition of the elements, but they spring forth into actual existence according to given opportunity ; for just as mothers are pregnant with their offspring, so the world is pregnant with the causes of things to be, which were created in it only by that Supreme Essence in which there is neither birth nor death, generation nor corruption).

From this quotation it may be clearly seen that St. Augustine holds that when God created the material universe, He placed in it *active energies*, which are the secondary causes under Himself, the First Cause, for the production of all things that come into existence. The passage is capable of a singularly evolutionistic interpretation.

Again, in his commentary on Genesis (Lib. V., 44 and 45), St. Augustine compares the development of the universe to the development of a tree from the seed by the *active vital energy* of that seed. He confirms his evolutionistic conception of creation by the words of Holy Scripture (Gen. ii. 4) :

" These are the generations of the heaven and the earth, when they were created, in the day that the Lord God made the heaven and the earth : and every plant of the field *before it sprung up in the earth*, and every herb of the ground *before it grew*."

What he says of the plants he also affirms of animal life in his commentary on Genesis (Lib. VI. 2) :

" In cujus—*i.e.*, mundi—elementis simul sunt condita, quæ post accessu temporis orirentur, vel fruteta vel animalia quæque secundum suum genus "

(In the elements of which—*i.e.*, the universe—were implanted all those things which in process of time should come forth, whether plants or animals, according to their kind).

A little further on in the same passage he questions whether man was created as we know him now, or whether "in occulto sicut fœnum agri antequam exortum est" (in a hidden manner, like the grass of the field before it grew).* This question he answers (in "Gen.," Lib. VII., 34-36), saying that all human souls were created at the same time in the beginning of creation, together with the angels and the chaotic material universe, in the elements of which was implanted the germ of the human body:

"Cujus corporis in illis simul conditis rebus rationem creasset causaliter, secundum quam fieret, cum faciendum esset, corpus humanum" (The germinal reason of which body He created amongst those things which were together founded, according to which the human body was to be made when the time for fashioning it arrived).

Similar quotations from the writings of the great Doctor might be largely multiplied, but I think I have given enough to show the mind of St. Augustine. If we compare what he says about the forma-

* Perhaps it will not be irrelevant if we quote the words of the Apocryphal Fourth Book of Esdras, as instancing some Hebrew tradition on this point: "And (Thou) gavest a body unto Adam without soul, which was the workmanship of Thine hands, and didst breathe into him the breath of life, and he was made living before Thee" (4 Esdras iii. 5).

tion of the human body with what he has said before about the origin of the plants and animals, it can scarcely be doubted that he held that the Creator implanted in the elements of matter active energies capable, in process of time, of producing the human frame. Scotus dedicates an entire article (2 " Dist.," xviii.) to prove, with his wonted force and subtlety, that by the " rationes seminales " of St. Augustine not mere passive receptivity, but rather *active energies* implanted in matter, are intended. It is wonderfully like " evolution." St. Thomas was evidently attracted to the doctrine, while at the same time exceedingly cautious about how he admitted it into his theology. He sums it all up in 1*a* CXV., ii., where, commenting on the words of St. Augustine in " De Trin.," III., 8—" Omnium rerum quæ corporaliter visibiliterque nascuntur, occulta quædam semina in istis corporeis mundi hujus elementis latent " (Certain hidden germs, of all those things which are corporeally and visibly produced, lie concealed in the material elements of this universe)—he says :

" Manifestum est," etc. (It is manifest that seeds are the active and passive principles of generation from which living forms are produced. Wherefore Augustine (in the place quoted above) aptly calls all active and passive powers, which are the principles of natural generation and motion, *seminal reasons.* However, these active and passive powers may be considered in many ways. First, as Augustine says (VI., *super* " Gen.," c. 10 et 18), they are principally and according to origin in the Divine

Ideas of the Word of God.*; secondly, in the elements of the universe, as in universal causes, in which they were produced by creation in the beginning; thirdly, they are in those things which in course of time have come forth from these universal causes—that is to say, in *this* plant and in *that* animal, which, again, are, as it were, particular causes; fourthly, they are in the seeds which are produced from these animals and plants, which, again, may be compared to other effects as primordial and universal causes of these effects to be produced).

These words, though intelligible enough to the metaphysician, require a little explanation for that very numerous class of persons whom I have known whose natural aptitude is towards speculation, but whose manifold occupations have precluded them from giving themselves as they might have done to the study of higher metaphysics.

St. Thomas Aquinas, whom I reckon a thinker scarcely to be equalled, and by no means to be surpassed, here says that the causal or *seminal* reasons of all the corporeal things that are may be said to exist in a fourfold manner—first, in the ideas of the Divine Intelligence, whence they came forth by creation; secondly, after a latent manner in the

* When we consider this, and then call to mind that the Word in Whom all things were made was born of Mary, and lived with us and for our sakes the long-drawn agony of mortal life, the awe with which such a thought inspires us would be positively oppressive were it not so unutterably sweet. The condescension which has descended to such depths will descend to any depths for our sake.

elements of the material universe by the active and passive powers which the Creator implanted in matter; thirdly, in the creatures themselves, which have been produced from matter, just as in Holy Scripture the Creator spoke to Jacob, saying, "Nations and peoples of nations shall be from thee, and kings shall come out of thy loins" (Gen. xxxv. 11); fourthly, in the seed which proceeds from the living creature, which is the universal and primordial cause of the life with its manifestations germinating from that seed, just as every branch and leaf of the oak may be said to pre-exist in the acorn.

In the same article, in his solutions of difficulties, St. Thomas speaks in a similar strain. He refers to not only the passive powers, but also to the active energies implanted in matter from the beginning of creation, from the union of which active and passive virtues all material life has its origin. We have seen that the human soul is not material, and, consequently, could never have pre-existed in material energies; but all purely material entities may be said to result from the union of the active with the passive. Wheresoever there is propagation, or increment, or material motion of any kind, there must be the active energy dominating, directing, and moulding the passive matter.

We can account for the shyness of Aquinas in unreservedly admitting the doctrine of Augustine from the fact that the Bishop of Hippo's view of the

evolution of the human body is so nearly connected with his platonic opinion concerning the simultaneous creation of all angels and human souls together—a doctrine which I should dearly love to hold if I could find reasons to support it, for it opens up such an immense field for lofty speculations, and throws so great a light upon that deep and terrible mystery, "original sin." Plato swayed the minds of the early Christian writers with the same dominating influence which Aristotle exercised over the thought of the Middle Ages; nor has the Church ever lost the impress of his teaching, but she knew that we required the clear-cut, well-balanced reason of the Stagyrite to safeguard us against the possible extravagances of Plato's mysticism. It is marvellous to witness how, under inspired guidance, the Church absorbs and assimilates any philosophy which proves apt for the expression of her revelation. She has made use of Plato, she has made use of Aristotle—who can say whether she will adopt or eschew "evolution"? Let theologians proceed with caution, neither rashly upholding an unproved hypothesis nor unnecessarily yielding to groundless fears.

The theory of evolution must remain in the smelting-pot a good while yet before we shall be able to form anything like an accurate idea of what is what. Gradual development from the imperfect to the perfect appears to be a very universal law in

all earthly things. Moreover, we are confronted with the fact that in former epochs the earth was stocked with forms of life which have now almost or wholly disappeared, and their place is taken by other forms of life which, though possessing much in common with the older and extinct forms, are yet widely different. We are, therefore, forced to the conclusion that creation was a very slow and gradual process, but as to the laws and method of that process we are, and perhaps always shall be, very much in the dark. What we are now endeavouring to learn are the methods used by the Creator in the production of things. We cannot, I think, fail to admit that variation, modification, adaptation, have been at work in a very much greater degree than used to be supposed; but the question propounded by Darwin has up to this received no satisfactory answer—namely, whether many existing species have been derived by evolution from one primordial form, or whether we are "to look at species as having been specially created, and at varieties as having been produced by secondary laws" ("Origin of Species," chap. viii.). One of our greatest difficulties in solving this question is that pointed out by Darwin himself ("Origin of Species," chap. ii.)—namely, that our distinction between species and varieties is most vague and arbitrary; consequently, biologists as often as not are found to be arguing in a vicious circle. It

seems to me that while Darwin lays stress on this logical fault in others, he is nevertheless not altogether free from it himself. If, however, we glance at two species undoubtedly distinct—for example, the eagle and the dove—we may well say that he who holds that both are descended from one common progenitor will find that his hypothesis requires a deal of proving.

One thing, however, we may with certainty affirm —namely, that even if evolution were proved to the hilt, it need not in the least trouble the faith of a Catholic ; for while we believe that God formed man from "the slime of the earth," it is quite immaterial whether He did so abruptly, or whether by the gradual process of evolution, breathing into the body its immortal life-principle when that body had arrived at an organization fitted to receive it. We have seen that the immaterial nature of the human soul requires a special act of creation, that it could not be potentially resident in matter, and that, consequently, it could never have been evolved by material energies. To one, therefore, who has grasped the exigencies of the relation between cause and effect, Darwin's words in the "Descent of Man" (chap. xxi., Summary) are a matter for wonder : "Few persons feel any anxiety from the impossibility of determining at what precise period in the development of the individual, from the first trace of a minute germinal vesicle, man becomes an immortal

being ; and there is no greater cause for anxiety because the period cannot possibly be determined in the gradually ascending organic scale." If this really implies the idea of "evolving immortality," to the metaphysician it must sound sufficiently absurd, while no Catholic could possibly reconcile such a notion with his faith. For the special creation of man is a point of faith, and though this does not, perhaps, forbid us to hold that the human body was produced by evolution, it certainly excludes the evolution of the soul, for man is man precisely on account of his possession of a rational soul.

In his later years Darwin's conception of Deity became most shadowy and vague ; indeed, I fear it would be difficult to defend him from the charge of sheer agnosticism. But he certainly was not amongst the number of those who are so idiotic as to deny the existence of a First Cause as the power behind all those manifestations of created energy which we see around us. Indeed, it seems scarcely conceivable that a man who had read so deeply into the secrets of Nature should fail to recognize an ever-present overruling Intelligence. In his chapter on the "Struggle for Existence" he tells us :

"Battle within battle must ever be recurring with varying success ; and yet in the long run the forces are so nicely balanced that the face of Nature remains uniform for long periods of time, though assuredly the merest trifle would often give the victory to one organic being over another."

Who could reflect on this nice balance of the forces of Nature, almost infinite in their complexity, when the merest trifle would upset the just equilibrium, and not recognize the guidance of almighty and limitless intelligence ?

It is not very often that we find a man of science of the first order who is professedly an atheist.

Evolution, then, does not in the slightest interfere with our faith as Catholics ; neither, as I have already shown, does it in any way go counter to the principles of scholastic philosophy. In fact, it is nothing more than an amplification of these very principles, an implanting them in new ground where they had not been previously sown.

But now I must descend from the region of higher metaphysics, which deals with such abstract matters as are contained in general principles, and the necessary deductions therefrom, and I must enter upon the province of the physicist who reasons by induction. I do this not without an apology to the expert, for, in truth, there is some presumption in treating of technical matters without technical knowledge (it were well if scientists also would bear this in mind when they dabble in theology). Professor Windle's remark, put forward with characteristic modesty, that theologians would act advisedly if they left for a time new scientific theories to the corrosive criticism of the expert, is just enough. At the same time, one cannot help forming one's own opinions ;

and when we hear on all hands the upholders of evolution, especially those who are scantily educated, making blatant assertions about the origin of all things, in the heavens above or in the earth beneath, we may surely be allowed to put in a word of our own. The time may have been when people were priest-ridden, but there is no doubt about it that we are scientist-ridden nowadays, and I do not know that the exchange is so very advantageous after all, for it is only a few who really know anything about science, just as it was, and is now, only a few who really understand theology. But it is a curious thing that the majority of persons show a strong disposition to talk much about matters of which they know nothing.

As regards our own attitude towards the discoveries of physical science, we are always ready to accept proven fact, as long as it is proven. More than that, we are ready to listen with the greatest respect to scientific theories, but we stubbornly refuse to have these thrust upon us as certainties, while they are yet only matters of conjecture ; they may be supported by a weight of argument which gives them a preponderance of probability, or the arguments may be evenly balanced, or there may be little to be argued in their favour. They stand at the tribunal of reason, and must be judged by what they can show in claim of our acceptance.

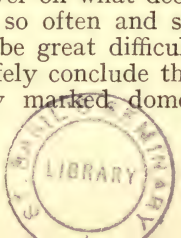
We must always bear in mind that even the

greatest probability does not make a certainty, and we refuse to accept it as such.

I shall therefore be so bold as to pass a few remarks upon Darwin's principles one by one.

In the first place, are we really justified in drawing a comparison between man's dominion over natural forms by artificial selection and Nature's process in the production of species ? It is by no means evident that we are. We have only to walk through a greenhouse or to glance casually at any domesticated race of animals to be well aware that man's power of " subduing the earth," of moulding natural forms to a wonderful extent, is truly marvellous. But at the same time we are confronted with the fact that when his controlling hand is withdrawn, even for a short time, the creations of his industry quickly relapse to a feral state. On this Darwin remarks in his first chapter on " The Origin of the Species " :

" Having alluded to the subject of reversion, I may here refer to a statement often made by naturalists—namely, that our domestic varieties, when run wild, gradually but certainly revert in character to their original stocks. Hence it has been argued that no deductions can be drawn from domestic races to species in a state of nature. I have in vain endeavoured to discover on what decisive facts the above statement has so often and so boldly been made. There would be great difficulty in proving its truth ; we may safely conclude that very many of the most strongly marked domestic varieties



could not possibly live in a wild state. In many cases we do not know what the aboriginal stock was, and so could not tell whether or not nearly perfect reversion had ensued."

Of course, this is a question, I suppose, beyond the powers even of the most expert naturalists finally to settle. Nevertheless, the arguments which favour the general law of reversion are immeasurably more numerous and more weighty than those which could be adduced to disprove it. Take the example of a class about which we do know something—the class which Darwin took for his special study—namely, pigeons. If any Londoner will take the trouble to bring to mind the pigeons which used to fly around St. Paul's five-and-twenty years ago, he will recall that they were a motley set of mongrel birds, variegated and mottled to any extent. If he will look at them now, he will perceive that they have almost entirely thrown back to the slaty blue, with the barred wings and tail of the aboriginal blue-rock.

If, then, we can prove reversion to have taken place in those cases where the original is known, we have a good argument by analogy for supposing that reversion takes place also in those cases where the original is not known. Besides, if Darwin makes use of our ignorance of original forms in favour of evolution, it is an argument that can be turned against him, for it tells against development

just as much as it tells against retrogression : if we are ignorant as to the extent of retrogression, so also we are ignorant as to the extent of development. As a matter of fact, however, an argument drawn from our ignorance of a subject is no argument at all ; we reason from the known to the unknown, but what conclusion was ever deduced from unknown premises ? Moreover, as Darwin says, " we may safely conclude that very many of the most strongly marked domestic varieties could not possibly live in a wild state." This being the case, are we justified in finding an analogy between a process (domestication) which is weakening to the stock in its struggle for existence, and another process (natural selection) which is strengthening and improving to the stock ?

We cannot, therefore, be very sure of our analogy between domestic varieties and species in a state of nature. Darwin himself would be fain to admit that evolution by natural selection requires a deal of special pleading ; but special pleading is not very satisfactory, and it is not science.

The material which either natural or artificial selection makes use of for the formation of new types is *variation*, which is sealed and made relatively permanent by heredity. We cannot doubt that laws of heredity exist, for, as noticed by St. Thomas Aquinas, not only the substantial form, but also very often accidental and individual characteristics, are transmitted from parent to offspring. What,

however, these laws of inheritance are we do not know ; Darwin says of them :

" The laws governing inheritance are quite unknown ; no one can say why a peculiarity in different individuals of the same species, or in individuals of different species, is sometimes inherited and sometimes not so ; why the child often reverts to certain characters in its grandfather or grandmother, or other more remote ancestor ; why a peculiarity is often transmitted from one sex to both sexes, or to one sex alone, more commonly, but not exclusively, to the like sex " (" Origin of Species," chap. i.).

Mendel's splendid discoveries have thrown a flood of light upon this abstruse problem, yet still much remains to be cleared up. It is only natural variations that are ever inherited, for, as Darwin tells us (" Origin of Species," chap. iv.), there is no proof that mutilations are ever transmitted by inheritance.

About variations Darwin seems almost equally in the dark ; concerning them he says :

" Our ignorance of the laws of variation is profound. Not in one case out of a hundred can we pretend to assign any reason why this or that part differs, more or less, from the same part in the parents " (" Origin of Species," chap. v., Summary).

And again :

" We are profoundly ignorant of the causes producing slight and unimportant variations " (" Origin of Species," chap. vi.).

Still, he insists that a cause for each slight variation must exist (" Origin of Species," chap. v., Sum-

mary)—a statement which the metaphysician will scarcely be disposed to call in question. What does cause variations? As regards animals, Darwin is of opinion that heat, moisture, light, food, etc., have little *direct* effect in producing them; but he thinks that such things may have an important indirect agency by affecting the male and female reproductive elements; here he strikes at the root of the question, and touches on Mendel's momentous discoveries. We have always thought, moreover, that "maternal impressions" had something to do with it; but Professor Windle scouts the notion: in his article on "Weismann and the Germ-Plasm Theory," in the *Dublin Review* of April, 1906, he says:

"It [belief in the possible inheritance of mutilations] must be set with that other belief in maternal impressions, so old, so often exploded, yet still so firmly held by many."

The idea is certainly a very old one—at least, as old as the days of Jacob and Laban. St. Augustine ("De Trin.," Lib. III.) comments on it thus:

"Verum propterea factum Jacob de pecoribus commemorandum arbitratus sum," etc. (Wherefore I have thought fit to mention the fact concerning Jacob's flocks, in order that it might be understood that if the man who so placed those rods cannot be called the creator of the colours of the lambs and kids; nor even the souls of the mothers themselves, which, as far as Nature allowed, imparted to the

germinal particles conceived within them the variegated images received through their organs of sight ; much less, etc.).

Yes, it is certainly a very old opinion, and is still firmly held by many. No breeder of stock would allow a pregnant pedigree Shorthorn to be mixed up with Herefords, for fear she should throw a white-faced calf. Moreover, any medical man will tell you that monstrosities are sometimes the result of " maternal impressions "; and Darwin tells us that " monstrosities cannot be separated by any clear line of distinction from mere variations " (" Origin of Species," chap. i.) ; and again :

" We have also what are called monstrosities, but they graduate into varieties. By a monstrosity, I presume, is meant some considerable deviation of structure in one part, either injurious or not useful to the species, and not generally propagated " (" Origin of Species," chap. ii.).

In the biographies of celebrated men we are sometimes told that the peculiar bent of their genius had a strange correlation with some impression received by their mothers during the time of pregnancy. In fine, such curious coincidences of this sort have come under my own notice that I cannot help being tenacious of the old superstition—if I must call it so —about " maternal impressions."

Since Darwin wrote " The Origin of the Species," much has been done to dispel our ignorance of the

laws governing variation and heredity. At a time when Darwinism reigned supreme, Gregor Mendel, an obscure Augustinian monk, was laboriously experimenting with teutonic patience upon ten thousand different kinds of plants. He was a true man of science after Bacon's heart, who left theories alone, and went straight to the root of things, seeking enlightenment from the facts of nature. The result of his conscientious devotion to truth were discoveries brilliant, momentous, epoch-making. The name of the man, who was disregarded while he lived, now rings through the scientific world, and many of the most competent judges confidently affirm that the " Mendelian Laws " have once and for all knocked the bottom out of " natural selection " as the prime factor in evolution. I must, however, confess for my own part that it seems to me that while the Mendelian laws throw much light on " variation," they leave " natural selection " much where it was before. " Natural selection," as we have seen, is the very backbone of Darwin's system. In his " Introduction " he says :

" In considering the origin of species it is quite conceivable that a naturalist, reflecting on the mutual affinities of organic beings, on their embryological relations, their geographical distribution, geological succession, and other such facts, might come to the conclusion that each species had not been independently created, but had descended, like varieties from other species. Nevertheless, such a

conclusion, even if well founded, would be unsatisfactory until it could be shown *how* the innumerable species inhabiting this world have been modified so as to acquire that perfection of structure and adaptation which most justly excites our admiration."

It is beyond question that varieties within the limits of the same species are continually springing up, but that species arise from species has yet to be proved. Even if proved, we have still to ask ourselves the question, *How* does it occur? Darwin answers that *how* by asserting that the main factor is "natural selection," and his great life-work was to elaborate the proof of this thesis. What he means by "natural selection" he explains as "the preservation of favourable variations and the rejection of injurious variations" ("Origin of Species," chap. iii.), and he sums up his whole system concisely in the one general law—"multiply, vary, let the strongest live and weakest die" ("Origin of Species," chap. vii.). At the same time he says "natural selection can do nothing until favourable variations *chance to occur*" ("Origin of Species," chap. vi.). He declares, of course, that variation does not really result from chance, for there is no such thing as chance in natural productions, but we call it chance in our ignorance of the laws which control variation. Mendel has laid solid foundations for the deciphering of these laws. What a pity it seems that these two great men never met! How much they might have done collaborating together!

Professor Windle says that—

" Now many hold that natural selection does not exist," and " if natural selection exists, it is nothing, and can be nothing, but a sieve by which certain changes which have in some way or another arisen are tried, and retained or lost. It postulates an internal force of variation following some law, and again demands the existence of a law and of a law-giver " (Essay on " Scientific Facts and Scientific Hypotheses ").

Darwin would, of course, have admitted the truth of these latter remarks, but he gave to natural selection a preponderance which the best authorities of to-day will not grant to it. With natural selection relegated to an altogether subsidiary place, with doubts thrown upon its very existence as a law of Nature, Darwinism pure and simple becomes more hypothetical than ever.

If I may be permitted here to express my own personal views, I should certainly say that it seems to me obvious that natural selection is a factor in the maintenance and improvement of species—at any rate, within the limits of each species—and that the term " species " may embrace a great deal more than has been supposed up till recent times. There can hardly be a doubt that a struggle for existence is always going on amongst living forms, and this struggle must surely imply that those forms will ultimately prevail which are better equipped for the warfare.

We must, however, allow that the difficulties which Darwin saw and acknowledged in the way of his theory are still there, and that time and research have not diminished, but rather increased them. It is by no means apparent, in fact, that the best-equipped have always survived. The words of the wisest of men may be applied here : " I turned me to another thing, and I saw that under the sun the race is not to the swift, nor the battle to the strong " (Eccles. ix. 11). Organs of apparently little importance have sometimes been highly developed, while others which would seem most useful have declined. Occasionally, as Darwin admits, where in the thirteenth chapter he treats of embryology, it looks as if the action of evolution had been positively retrograde. The sterility of undoubted hybrids is an admirable contrivance for preventing confusion in Nature, but it does not point towards a common parentage—rather the reverse—and all Darwin's clever special pleading on the subject has done little or nothing to remove the difficulty. Then there is the great difficulty which Darwin felt to be the weightiest of all—namely, the absence of links. If, as he contends, natural selection has acted upon variations for the most part almost infinitesimally small, then certainly, as he himself admits, the number of these links must have been truly enormous (" Origin of Species," chap. ix.). And, as he says a little further on in the same chapter,

they "must assuredly have existed." But where are they? Neither with us now, nor recorded in the strata of the earth—at least, as far as geology can show, and geology has made immense strides since Darwin's time. His manner of accounting for their disappearance without leaving behind them a single trace is ingenious, but wholly unsatisfying. If that process has been and is always going on, it is inconceivable that it is nowhere to be discerned. It is this want more than any other which has wrecked Darwinism, and has caused the scientific world to look more and more askance upon his theory, until it is now almost wholly abandoned and superseded.

Perceiving the enormous weight of the arguments against the evolution of species by the gradual, almost imperceptible, transition of one into the other, many evolutionists have fallen back on a theory of evolution by abrupt leaps. This position is well worthy of our consideration, for it does not altogether lack the support of good arguments in its favour. Indubitable as it is that Nature, considered in its full extent, graduates from the lowest to the highest, yet between each gradation in any particular line there is quite a noticeable gap. If the horse of our day has been really derived from the genealogical pedigree which evolutionists suppose, we must allow that the gradations, though they follow in true succession, are yet abrupt and striking. Darwin admits

this in some cases, notably that of the ancon sheep (" Origin of Species," chap. i.). The origin of this type of sheep is as follows : A ewe belonging to a Massachusetts farmer named Seth Wright gave birth to a lamb with short legs like an otter. Wright perceiving that if this variation could be transmitted he would rear a race of sheep unable to jump fences, etc., which would prove an advantage to the shepherd in tending his flock, he bred from this lamb, with the result that he produced the ancon or otter race of sheep. In this case, it may be remarked, that artificial selection went counter to natural selection, for the variation, though advantageous to the farmer, would be harmful to the interests of the sheep. What, however, we must particularly note is that the variation did not come gradually, but at one bound. The mere fact of variation at all postulates the existence of a Supreme Energizer as the power behind Nature—in fact, evolution by jumps is the same thing as derivative creation—a view which no Christian need be distressed about embracing—and if the Creator makes use of natural selection as a means to test and mould His productions, why should He not do so ? All natural law is but the voice of God, as Aquinas says :

" Jussio Dei naturalem motum corporibus præbet : unde dicitur quod suis naturalibus motibus faciunt verbum Ejus " (The command of God imparts to

bodies their natural motion, wherefore it is said that by their natural motions they perform His word) (1*a* LXIX., 1 ad 1*um*).

We must, however, remember that "natural selection" is not a well-established law of Nature. It may, after all, be only a figment of the human brain. Many competent judges, as I have observed, reject it altogether. Even if it be a law of Nature, it does not give origin to developments—in fact, it merely acts as a crucible to test the variations from which developments come, either retaining or rejecting them, whether these variations appear gradually or abruptly. Evolution as a natural process is only a hypothesis, and the three laws which govern it—namely, (1) variation, (2) natural selection, and (3) heredity—are also largely hypothetical, most especially "natural selection." Wherefore all that we say about evolution or its parts must be said with a big "if" at the beginning. It may be true or it may not be true, and, if true, to what extent true? It is obviously impossible to be fair to such a hypothesis without making statements which at first sight will appear inconsistent one with another.

Certainly, when all is said and done, evolution explains a great many things in Nature which are otherwise inexplicable at present to us, most of all the marvels of morphology, which Darwin calls the very soul of natural history, the wonderful trans-

formations of the embryo, the existence of rudimentary organs, and the strange cases of seeming reversion to a former type. These are the most striking amongst the many arguments producible in favour of evolution. Still, we must not mistake theory for fact, nor render unhesitating assent until compelled by evidence.

Even if evolution is true, none the less it will take a long time yet before all its complex laws have received their proper adjustment to make our conception thereof consonant with truth. But though much of Darwin's work will probably not withstand the test of time, still his will always remain a name to be revered for the impetus he gave to the study of biology.

It is not here my intention to hazard an opinion whether evolution is true or whether it is false. My aim is simply to show that, *if it is true*, it is in no wise hostile to faith, and that much authority can be found amongst the recognized writers of the Church to countenance its adoption. Yet, when we see the theory beset with so many internal difficulties, when we find men of science of the highest name repudiating it root and branch, as true philosophers we ought to be very cautious how we accept it ; indeed, we could not possibly in the present stage of our knowledge concede to it an unqualified adherence.

II

DARWIN only treats of the evolution of living forms ; the rest he leaves altogether alone. But since his time the theory of evolution has been extended over a much wider field, and it is maintained by some that the entire economy of the universe is the result of evolution. With this, too, I must briefly treat on the same lines as before.

Father Gerard, in " The Old Riddle and the Newest Answer " (Article III.), thus puts it :

" Others, again, do not limit this process—*i.e.*, of evolution—to organic creatures, and believe that from first to last the whole world, inorganic and organic alike, has resulted from the action of forces such as those with which science deals, and that life has thus arisen in purely natural course out of non-living matter, the universe in its original condition having been constituted as a vast machine which was bound to produce all that has since arisen."

With regard to evolution thus applied, whether we consider it as a *law* or as a *process*, I have nothing to say beyond referring the reader to Father Gerard's admirable little book, wherein he demonstrates that this theory is not even worthy the name of a hypothesis, but ought rather to be called groundless con-

jecture. It seems somewhat futile that men of intelligence should thus waste their time hazarding conjectures about matters whereof physical science alone neither does nor ever can teach us anything whatsoever. Guess-work of this kind rests upon no sound principles of reason, nor upon any experimental data ; it is just the vapourings of imagination, nothing more. The speculations, however, of the theologian in this matter are legitimate enough, for though his conclusions may sometimes be erroneous, at least he has the principles of revelation to go upon, and this is precisely the province of supernatural theology—namely, to draw reasonable conclusions from revealed principles, which conclusions, however, are no matter of faith unless they have been proclaimed such by the Church. We shall see a little later on, when I have a word to say about the evolution of dogma, that this does sometimes happen, so that what one generation believes implicitly the next believes explicitly.

I shall therefore now content myself with giving a brief abstract of St. Thomas Aquinas's view of the Creation as recorded in Genesis, sometimes introducing the opinions of other ecclesiastical writers, or here and there passing a remark of my own. The reader can then compare it for himself with the fables of unscientific science. In doing this, I shall be obliged unavoidably to go over again some of the ground I have already covered.

I must, however, prelude this part of my treatise by one or two remarks made by St. Thomas as a timely warning to those who would be too precipitate or oversecure in their interpretations of Holy Scripture. He bids us remember (1*a* LXVIII., 3 c.) that Moses was addressing himself to a semi-barbarous people, and that he adapts his language to suit the capacity of their understandings. Further (1*a* LXVIII., 1 c.), he says that in questions of this kind Holy Scripture may be interpreted in many different ways, and that we must not, consequently, be overzealous in maintaining that interpretation which appears to ourselves most pleasing, lest incontestable reasons should be found to militate against our cherished interpretation, and in consequence of our obstinacy in maintaining our opinion we excite the ridicule of unbelievers against the truths of faith, and put a stumbling-block in the way of its acceptance by them. Would to God that theologians had been always mindful of this salutary injunction! Moreover (in 1*a* LXII., 4 ad 3*um*), quoting from St. Augustine, he tells us that in the primary institution of created things we must not look for a miracle, for we are concerned with the founding of Nature and Nature's laws. Even more to the point and of wider interpretation is what he says in 1*a* XCIX., 1 c. :

" In omnibus asserendis sequi debemus naturam rerum, præter ea quæ auctoritate divina traduntur,

quæ sunt supra naturam " (In whatsoever assertions we make, we should adhere to the nature of things, except with regard to those which are delivered by Divine authority as being above Nature).

There was never a stouter champion of reason's sovereignty than Aquinas. He will only yield up the sceptre of reason to the claims of faith, and that because he recognizes that the mysteries of faith are above reason.

Having now laid down these simple but important rules for our guidance, I will proceed to consider the account given in Genesis of the origin of things :

" In the beginning God created heaven and earth. And the earth was void and empty, and darkness was upon the face of the deep : and the Spirit of God moved over the waters " (Gen. i. 1-2).

The opening words of Holy Scripture tell us of the origin of the universe and of an Intelligent Omnipotent First Cause. Metaphysically speaking, it is a matter of dispute whether it would have been possible for creation to have existed from eternity. We need not, however, enter into this interminable question ; whensoever our finite intellects attempt to grapple with the infinite, we find ourselves for ever arguing in a circle ; consequently, the " arguments " and " defendants " on either side can do little more than multiply words without ever coming to a sure conclusion. However, faith and the physical sciences both teach us that, as a matter of fact, the universe did have a beginning ; furthermore, that

finite existence must have proceeded from an Infinite Existence ; that things which of themselves need not exist have necessarily originated from Something that *must* exist ; that from the formless Chaos has been evolved the ordered beauty of this inconceivably and inexpressibly wonderful Cosmos ; and that, consequently, there must be a universal Lawgiver, a Supreme Evolver, are truths so patent to the intelligence that whosoever denies them had better, once and for all, give over any attempts at abstract reasoning. The existence of this First Cause, which reason can prove up to the point of rigorous demonstration, faith also proclaims, saying, " In the beginning God created the heaven and the earth."

Nevertheless, we are not to conceive of the heaven and the earth in their first creation as we behold them now, but, to quote the words of St. Augustine, abstracted from " De Genesi Contra Manichæos," I., cap. 5 *et seq.*) :

" Primo ergo materia facta est," etc. (At first matter, therefore, was made confused and formless, whence all things distinct and formed were made—a state of things which the Greeks called " Chaos." And therefore God is rightly held to have drawn all things out of non-entity: for though all were fashioned from this matter, the matter itself was called into existence from sheer nothingness. This chaotic matter, then, which God made from nothing was called heaven and earth in the first place, not because it was already this, but because this it was to become.

For heaven is described as subsequently made. Just as if, when considering the seed of a tree, we should say that there are the roots, the trunk, the branches, the fruit, and the leaves, not because they are there already, but because they will hereafter spring from it : so also it is said that in the beginning God created the heaven and the earth, as it were the germ of heaven and earth, since the matter of the heavens and the earth was yet in a state of confusion. But since it was assured that the heaven and the earth would thence arise, the primary matter itself was called heaven and earth. The same matter He also called water, upon which moved the Spirit of God, in the same way that the will of the artificer broods over the work he is about to fabricate. It is called, therefore, heaven and earth, because from it heaven and earth were to be formed. The earth is called unsightly and void, and darkness is said to be over the abyss, because without form, presenting no shape by which it could be seen and felt, even had man been present to see and handle. It was called water, because it lay ductile and malleable in the hand of the Operator, that from it all things might be fashioned. Under these names was comprehended the vacant, formless matter whence God made the universe).

Concerning this question of formless matter, the scholastics, taking for their theme Aristotle's doctrine about "Materia prima" and "Forma substantialis," indulge in subtle and profitless disputations as to whether it is within the range of possibility—*i.e.*, by the exercise of God's almighty power—that "materia prima" could ever have actual existence without being actuated by any

" forma substantialis " whatsoever. I need not weary the reader by a recapitulation of these interminable disputes. That is not what is here meant when it is said that the earth was without form ; all the scholastics agree with Peter Lombard, the father of scholasticism, in his interpretation of this passage of Genesis,—namely, that matter

" in confusione et permistione quadam subsistens, nondam pulchram, apertamque, et distinctam receperat formam, qualem modo cernimus " (subsisting in a confused and conglomerate state had not as yet received that beautiful, clear, and defined form which we now behold) (" Mag. Sent.," II., Dist. 12, cap. " De Qua re ").

Thus it is that the Book of Genesis speaks of the vast chaos composed of all the elements of the universe shapeless and without order, in the words before quoted :

" And the earth was void and empty, and darkness was upon the face of the abyss : and the Spirit of God moved over the waters."

—in which words we contemplate a vast shapeless chaos of inert mingled matter without motion, without light, without heat, without life.

In fact, if, indeed, the whole universe is the outcome of the union of Matter and Force, the words of Genesis convey to the mind the idea of matter not yet actuated by force. To the metaphysician it is as easy to conceive the notion of forceless matter as it is to conceive the notion of lifeless matter. The physicist, however, the nature of whose studies,

unless they have been preceded by a sound course of metaphysics, will tend to narrow his intelligence and, by consequence of constant attention to sensible phenomena, render him very largely incapable of appreciating the cogency of abstract reasoning, will probably denounce as inconceivable the idea of inert matter as yet unactuated by the various forces or energies with which we see it endowed. He need not, however, suppose that the words of Genesis necessarily postulate that the primeval chaos consisted of the confused elements of matter altogether divorced from, or, rather, not yet impregnated with, the multifarious forces, energies, or laws which have operated in the formation of the Cosmos. For St. Augustine (in "Super. Gen. ad Litt.," Lib. I., c. 15) says the unformed state of matter did not precede its formation in *duration*, but that the account in Genesis merely follows a certain natural order of fitness. (I say *duration*, not *time*, because it would be absurd to speak of time before the congregation of matter into the heavenly bodies, since time is nothing else but the measure of the motion of this globe in its course round the sun.) In the same sense speaks Aquinas, who distinguishes the primary foundation of the universe and the substantial distinction of its elements* from its adornment;

* We must not suppose that the schoolmen had got as far as our modern chemists in their notion of what the elements of the universe are. They understood only four —*i.e.*, earth, air, fire, and water.

the former, he holds, is not to be measured by duration, but the latter is subject to time. The view of both these great doctors is admirably summed up by the subtle Scotus ("De Montefortino Scoti Summa," 1*a* LXVI. 1 ad 2). He says that both nature and art always proceed from the imperfect and indeterminate to the perfect and determinate, and that the imperfect precedes the perfect in duration; he goes on to reason that Art being but a copy of Nature shows the manner of working peculiar to the Author of Nature: the created, in its operations, imitates and shadows forth the operations of the Creator. He concludes, therefore, by analogy that the formation of the Cosmos out of Chaos was a process of slow duration. None the less he answers his own reasoning by saying that though the limited powers of Nature will only allow of her attaining her end by slow degrees, passing through set and prefixed gradations, yet the limitless power of the Creator can produce the perfect work at once. He therefore holds to the opinion that God created the perfect Cosmos from nothing in a moment of time, and afterwards proceeded to its adornment when, by the vital forces of Nature, seconded by the influence of the heavenly bodies, living forms began to appear upon the earth. In this he accords in the main with St. Thomas, who divides the work of creation into three divisions—*i.e.*, creation *en masse*, the distinction of its parts,

and, thirdly, its adornment ; he considers that the work of adornment alone falls under the measurement of time. I merely record this in order to show that it is not necessary to suppose that matter was created in the beginning altogether inert and forceless—a proposition which would seem absurd to all physicists who were not first thoroughly imbued with the principles of metaphysics. Indeed, the course taken by SS. Basil, Ambrose, Chrysostom, and others, our modern advancement in the physical sciences obliges us to hold as the true one—namely, that in the beginning of Creation God created the elements of matter all distinct and endowed with their manifold forces or energies, yet indiscriminately mingled in one confused universal chaos, out of which these inherent energies implanted and directed by the Creator immediately began to evolve the ordered Cosmos.* St. Thomas fully admits as permissible, and hypothetically defends, the opinion of these doctors where he says (1*a* LXVI. 1 ad 1*um*) :

" Dicendum est quod si secundum alios sanctos informitas tempore præcessit formationem, non fuit hoc ex impotentia Dei, sed ex Ejus sapientia, ut ordo servaretur in conditione rerum, dum ex imperfecto ad perfectum adducerentur " (It must be stated that if, according to other saints [*i.e.*, St. Basil, etc.],

* I must here once again remind the reader of the words of St. Thomas. (1*a* LXIX., 1 ad 4*um*) : " The command of God imparts to bodies their natural motion : therefore it is said that by their natural motions they perform His word."

the formlessness of matter preceded by duration its formation, this does not come from any impotence on the part of God, but rather from His wisdom, that in the founding of things order should be observed, by their being brought upwards from an imperfect to a perfect state).

St. Thomas does not himself admit that the formlessness of matter preceded by duration its formation. Modern progress in the physical sciences obliges us, however, to adopt the view of St. Basil. Indeed, the extent of that duration is so prodigious as to baffle the wildest flights of the most fervid imagination.

In the cosmogony of the schoolmen we must expect to find a quantity of manifest crudities ; they knew nothing, or next to nothing, of chemical elements ; their ideas about natural forces were most hazy, and they believed the heavenly bodies to be made of different matter to our globe. Still, if we make allowance for all this, what wisdom they show in the way they deal with abstruse and profound questions, and how strangely their speculations shadow forth the discoveries and hypotheses of modern times !

The next step in the progress of Creation recorded in Genesis is thus stated :

" And God said : Be light made. And light was made. And God saw the light that it was good. And He divided the light from the darkness. And He called the light day, and the darkness night : and there was evening and morning one day."

An obvious difficulty at once presents itself to the reader — a difficulty which Professor Hovenden alludes to in his book "What is Life?" with a blasphemous sneer—namely, the production of light anterior to the formation of the heavenly orbs. It is easy to sneer, not so easy to be wise. Of course, this difficulty had been noticed and commented on by the early Christian writers, a few of whose explanations we will now proceed to consider.

We need not trouble ourselves about the question of the "days" of Genesis, for these are now universally held to signify "periods of time." But, as St. Thomas over and over again insists, we must bear in mind that Moses was not speaking to a civilized, but to a semi-barbarovs people, and it would have been quite useless for him to present to the rude understandings of the early Israelites anything but most matter-of-fact conceptions. He leaves the fuller interpretation of his words to a future time and a more enlightened generation.

About the production of light we may well believe that, with the first existence of matter, motion began, with motion friction and its concomitants, light and heat. Of these, only light is mentioned as being the most apparent, and as affecting the noblest of the external senses—namely, the sense of sight. Even in our own ordinary conversation we are wont to give this predominance to the visual power, applying its terminology to the perceptions of the other senses,

as when, for example, we say, " *See* how cold this water is," " *See* what a delicious taste these apples have," and so forth.

As regards the production of light before the formation of the heavenly bodies, some of the early writers say that this light refers to spiritual light—namely, the creation of the angelic intelligences ; this interpretation, however, appears to St. Thomas Aquinas improbable. The words of Genesis undoubtedly indicate material light. St. Thomas's opinion (1*a* LXII. 4 ad *2um*) is that this light was none other than the light of the sun, which, according to him, was already in existence, and that where the creation of the heavenly bodies is spoken of again on the fourth day we are not to understand that their first production is intended, but rather that indication is here given of the particular effects or uses for which they were meant, by reference to the living forms now for the first time to be produced ; since these required the succession of day and night, and the mutation of the seasons, that there may be for them a time of activity and a time of rest, a time of generation and a time of corruption. And because on the fifth day (or period) life was to appear upon the earth, therefore on the fourth day mention is more definitely made of the heavenly orbs on account of the influence which they exercise upon the ebb and flow of life. He opines that they were not actually made on the fourth day,

but it was then that their peculiar uses in the economy of this globe were fittingly designated.

I must, however, draw especial attention to an opinion which St. Thomas mentions without adopting. He does not, however, utterly repudiate it, but he sets it aside as " inconveniens "—an expression which in his phraseology usually means that he considers it unlikely or less probable. This opinion, which he makes mention of in 1*a* LXII., 4 ad 2*um*, is that light in the first instance was due to a universally diffused luminous cloud, which was afterwards absorbed into the body of the sun, or, rather, out of which the sun and the other luminaries of heaven were subsequently made as described on the fourth day in Genesis. The only reason which St. Thomas assigns for his rejection of this view is taken from the erroneous opinion of the ancients that the other orbs were made of different matter to our earth. Had the physical sciences been sufficiently advanced in his time to correct this error, it is very probable that he would have adopted instead of rejecting this opinion. It is, however, upheld by Alexander de Hales, another great scholastic, the precursor of the Scotist philosophy (" Mag. Alens," p. 2, q. 46, m. 5) :

" Porro lux illa non fuit lux solis, vel aliorum luminarium," etc. (This light, however, was not the light of the sun or other luminaries, which, in truth, were made on the fourth day, but there existed a certain luminous body made of the already pre-

existing matter at the presence of which over the earth day appeared, and night followed upon its setting, as is clearly stated by the Master of the Sentences (Sent. II., Dist. XIII., cap. 2). . . . Moreover, it is not to be supposed that this light ceased to exist upon the formation of the sun, moon, and stars, but rather that it was divided up into those orbs for the use of the earth and its inhabitants, and that to each its proper portion being attributed, it obtained new powers and efficacy for the production of various effects).

Making all needful allowance for unavoidable incongruities, this is a truly remarkable passage. Alexander contemplates the formation of the sun and other luminaries *out of the pre-existing luminous* matter of the universal chaos—whether gradually or abruptly he does not say, but the drift of his discourse would seem to imply the former. He conceives this work of formation as completed when the luminous matter has been gathered up and concentrated in the heavenly orbs ; that they should now begin their allotted task of marking off times and seasons, and of performing their part in the production and conservation of living forms. If what our moderns say is true—that the universe began as " fire-vapour," out of which the different orbs have gradually been evolved—it seems to us that Alexander's interpretation of Genesis comes very near the truth. As for the account of Genesis itself, instead of making it a butt for silly and shallow ridicule, we ought rather to be astounded at an

exhibition of inspired wisdom centuries and centuries in advance of the science of the age in which it was written: though, in truth, we should go cautiously here, for the knowledge of the ancient Egyptians is a more or less unknown quantity, and it is quite possible that they knew a great deal more about nature than we in our arrogance are wont to give them credit for.

To proceed further, the next step recorded in Genesis is the division of the waters, which is thus set forth:

"And God said: Let there be a firmament made amidst the waters; and let it divide the waters from the waters. And God made a firmament, and divided the waters that were under the firmament from those that were above the firmament, and it was so. And God called the firmament Heaven: and the evening and the morning were the second day."

We here contemplate the commencement of the formation of our globe, when the shapeless mass of indiscriminate matter begins to be collected at different points in the universe into orbs, amongst which only our earth is taken into consideration, because it is with the earth and its history that Genesis deals. I must once again call attention to the fact that this account does not necessarily suppose the chronological order of events in the action of the First Cause in His work of creation, but rather a sort of natural order of fitness.

1. First the chaotic matter created;

2. Then rendered visible by light;

3. Finally matter collected at different points in space by the power of attraction to form the heavenly bodies, amongst which our attention is riveted upon this earth, water-covered, and with its vapour-laden atmosphere around it, from which a habitable world is to be evolved.

This is certainly the order in which things naturally present themselves to our mind.

Hovenden, in his burlesque of Genesis, makes great fun of this division of the waters:

"The conception being that it was necessary to have waters above to permit rain to fall in the future. There is no idea that this reservoir of water would be exhausted in time, and that it must be necessary to replenish it in order to permit the continuous phenomenon of rain" ("What is Life?" Part III.).

This *conception*, however, was not the conception of that ancient writer Job, who says (Job xxxvi. 27): "He [God] *lifteth up* the drops of rain, and poureth out showers like floods." Job represents the First Cause as having made the laws of evaporation and condensation, and he is scientifically correct. We do not expect of Moses speaking to the rude people of Israel anything very accurate in the way of science, but we might expect of a modern professor that he should not insult his public by treating them to blasphemous nonsense of this kind. However,

the Island of Laputa produces more in the way of downright arrogant ignorance than any other place that I know.

The ideas of the scholastics—at any rate, the older ones—about the firmament are essentially crude. St. Thomas, however, amongst a multitude of conceptions which to ourselves seem gross and childish, appears to favour that which looks upon the firmament spoken of in Genesis as being " that part of the air in which the clouds are condensed," concerning which he says (1*a* LXVIII., 2 c.) :

" Si autem per firmamentum intelligatur," etc. (If, however, by the firmament be understood that part of the atmosphere in which the clouds are condensed, then the waters which are above the firmament are the waters which, being resolved into vapour, are raised above some part of the air, from which rain is generated).

Which is not such bad science, after all.

The next step in the process of creation is recorded thus :

" God also said : Let the waters that are under the heaven be gathered together into one place ; and let the dry land appear. And it was so done. And God called the dry land Earth : and the gathering together of the waters He called seas."

Concerning this I need say nothing except that if the earth was indeed gradually evolved from " cosmic vapour," there must certainly have come a period when the land rose and the seas were gathered to-

gether in their allotted place. This must have occurred somehow and at some time, from which conclusion we cannot escape. And it is this process of the segregation of the land from the sea which is here spoken of in Genesis.

A word, however, anent the expression, "And God called the dry land Earth, and the gathering together of the waters He called Seas," which might evoke the criticisms of certain persons. Concerning this St. Thomas, in 1*a* LXIX., 1 ad 5, quoting the opinion of Rabbi Moyses, says :

"Intelligitur autem ubique per hoc quod dicitur, *vocavit*, id est dedit naturam, vel proprietatem *ut possit sic vocari*" (Whensoever it is said, "He called," is to be understood that He gave the thing that nature or property from which it may be so named).

A name is given to a thing to express its nature, and He who founded the nature may figuratively be said to have given it a name, inasmuch as He made it something nameable.

On the same day mention is made of the production of plant life :

"And He said : Let the earth bring forth the green herb, and such as may seed, and the fruit-tree yielding fruit after its kind, which may have seed in itself upon the earth. And it was so done. And the earth brought forth the green herb, and such as yieldeth seed according to its kind, and the tree that beareth fruit, having seed each one according to its kind."

I need not delay on this point further than to remind the reader of the already mentioned opinion of St. Augustine, which Aquinas favours as the most reasonable—namely, that the plants are not supposed, by these words, to have been actually then produced, but rather is indicated the power imparted to the elements, "secundum rationes seminales," of producing material life in all its grades—an opinion which is supported by the frequently repeated expression of Holy Scripture, "Let the earth produce."

I must here, however, dwell a little on the interminable question of "biogenesis" and "abiogenesis"—a controversy which raged amongst the scholastics, and still rages amongst our modern men of science. I hold no brief for one side or the other, any more than I do either for or against evolution (in whatsoever way "evolution" is intended). There is only one way by which further light can be thrown on such subjects—namely, renewed experiment and fresh research. This is the province of the expert. We take our data from them, and draw our own conclusions. I therefore content myself in these matters, which are outside my own proper sphere, with merely recording the views of others, keeping my own opinions for myself alone, with perhaps an occasional remark thrown in here and there. As we compare the speculations of the medieval philosophers with those of modern times,

it is curious to notice how these speculations are fundamentally the same. We have conjectured much and asserted more, but we are no nearer solving these great problems than they were.

Concerning abiogenesis, St. Thomas has (in 1*a* LXXI. ad 1) :

" Avicenna posuit," etc. (Avicenna is of opinion that all animals can be generated from a certain mingling of the elements without seed, even according to natural laws).

This opinion, however, Aquinas repudiates as " inconveniens." He goes on to say that, whereas in every case the passive principle is elemental matter, the active principle is either the formative virtue in the seed, or the action of the sun in the case of creatures generated from putrefaction, or in the beginning of things the word of God, which produced animals from elemental matter either actually, according to other Saints, or virtually, according to St. Augustine :

" Non quod aqua aut terra," etc. (Not that earth and water have in themselves the power to produce all animals, as Avicenna held, but because the very fact that from elemental matter, by the activity of the seed or of the heavenly bodies, animals can be produced is referable to that virtue primarily imparted to the elements).

St. Thomas repudiates the abiogenesis of Avicenna, but it is extremely difficult—if, indeed, it is possible —to exonerate St. Thomas from having himself

opened the door to abiogenesis. By biogenesis we understand the production of a living thing from a living parent by means of seed ; so, if it were possible to us, we might trace back genealogically any living thing till we came to the origin of life—*i.e.*, the Supreme Life-Giver, who first imparted to matter that vital force which is noblest of all material energies, either by creating a perfect first parent, or by so infusing the vital force into elemental matter that it was fecundated ready to produce the living creature when the fitting time arrived. This latter is the position of St. Augustine. By abiogenesis, on the other hand, we understand the production of a living thing from non-living matter by a non-living agent. This position St. Thomas admits in one instance, and by that one instance he opens the door to abiogenesis, for (in 1*a* XCI., 2 ad 2 *et alibi*) he teaches that maggots are generated from putrefaction by the power of the sun ; but maggots, however low in the scale of life, are none the less living things, whereas putrefaction is non-living matter, and the sun is a non-living agent. If this is not abiogenesis, what is it ? It certainly is not biogenesis, so that to call it anything else but abiogenesis is like trying to get a foothold somewhere between " ens " and " non ens." To say that there is a formative virtue, a vitalizing energy, in a non-living body like the sun is to strike at the very roots of biogenesis. The sun does indeed co-operate in

the generation of all living bodies, but only as an extrinsic and accidental, not as an intrinsic and essential, cause of life.

Moreover, the position of St. Thomas is fundamentally the same as that of Avicenna ; the difference between them is a difference of degree, not of kind. St. Thomas (*loco citato*) says that Avicenna holds that all animals can be generated from properly disposed matter by the power of the sun, while he himself confines the vitalizing efficacy of the sun to the production of nothing higher in the scale of life than maggots. There is, therefore, no radical difference between the two, and if Avicenna's position is abiogenistic, so assuredly is that of St. Thomas. To exonerate the latter and impugn the former will require a great deal more special pleading than I should care to endorse—in fact, I do not think it can be done. In this respect they stand or fall together. Avicenna was a firm believer in an Omnipotent Creator, as the preface he wrote to his works shows us. He holds that nature, with all the manifold energies implanted in it, is the work of the Supreme Being. I therefore fail altogether to see in what his position fundamentally differs from that of St. Thomas.

Of course, if it could be shown that St. Thomas holds that the Creator implanted in elemental matter certain vital germs, which under proper conditions can be awakened to life by the fostering power of

the sun, and so produce maggots, and if Avicenna does not admit the existence of these vital germs, there would then be a difference between their respective positions ; but I certainly think that St. Thomas holds that in the production of maggots the active fecundating properties are derived wholly from the sun (" ex *sola* virtute cœlestis corporis "), though in the case of more perfect animals the sun's activity is confined to fostering the vital spark imparted by the male seed. Then, again, does Avicenna *positively* exclude the existance of these vital germs in elemental matter ? I must leave someone else to answer this question, for the sight of his ponderous tomes of antiquated anatomy and medicine daunted my courage for research.

The following quotation from Scotus (Sent. II., Dist. XVIII.) appears to commit him pretty definitely to abiogenesis :

" In elementis mundi hujus," etc. (In the elements of this world there are latent properties [" rationes seminales "], because they can be so tempered, either by a simple mixture or by juxtaposition, that from them is caused a certain quality or form, which is the stepping-stone to that which is more perfect [*i.e.*, the production of some creature]. . . . For the seminal reasons of these things [*i.e.*, the frogs to which he has just alluded] are, in the elements, tempered together by the collocation of one element with another in just proportions of quantity and quality).

This looks like abiogenesis clear and straight. Scotus seems to opine that if only one knew how

properly to mingle the elements, he could produce almost any creature he desired.

For my own part, I shall believe in abiogenesis only when it has been demonstrated to evidence, and I feel quite confident that this will never be.

However, it is treated of, and not altogether rejected, by the scholastic philosophers.

Whether we give our adhesion to biogenesis or to abiogenesis, as regards our present disquisition—namely, to discuss the traces of evolution which we find in the early or medieval Christian writers—it is clear that, whichever way we take it, all are agreed that on this third day (or period) the Creator first breathed into matter the properties of life—life, indeed, without conscious sensation, but still life. Evolutionists, whether they pin their faith to biogenesis or to abiogenesis, must at least concede that a time came when first life appeared upon the earth, which heretofore was in no condition to sustain life. How it is possible to conceive this without the intervention of a Primal Author of life those who would deny this must explain, for it is absolutely inconceivable to the intelligence which has grasped the first principles of causality. Darwin himself, and, indeed, all great thinkers, profess the utter inability of physical science to account for the origin of life, which can only be explained by reference to a life-giving Creator. Those who boldly assert the opposite without being able to furnish one single proof of

their assertions have no title to be classed amongst great thinkers ; any ignoramus can unblushingly assert, and his impudence may very likely win applause from those whose " number is infinite," but reckless assertion does not constitute thought, and the faculty of impudence does not make a great thinker.

Evolution without a Supreme Evolver is rank absurdity. But if we consider evolution as God's law of development, from Whose Being, infinite and uncaused, comes the impetus which causes variation, and Whose law of natural selection preserves and fosters the variation when it appears : although this has not been proven, it is, however, in no way counter to revelation, and whosoever likes to adopt it as a hypothesis need feel no disquiet, for he is but following in the footsteps of St. Augustine, whose bold speculations have been in a greater or less degree incorporated into the philosophy of the schoolmen.

The next step in the biblical account of creation is thus worded :

" And God said : Let there be lights made in the firmament of heaven, to divide the day and the night, and let them be for signs and for seasons, and for days and years : to shine in the firmament of heaven and to give light upon the earth. And it was so done. And God made two great lights : a greater light to rule the day, and a lesser light to rule the night : and the stars. And He set them in the firmament of heaven to shine upon the earth. And to rule the day and the night, and to divide the light from the darkness."

This description, though poetically beautiful, is scientifically crude ; but we must remember that Moses speaks according to the capacity of his audience. Moreover, we must suppose that chronological order is here, at any rate, departed from, for plant-life requires the influence of the heavenly bodies and the rotation of the seasons. St. Thomas, however, gives a good reason for this : he tells us that in the account of Genesis we are not so much to look for chronological accuracy, but rather for a certain idealistic order—first, as I have said, creation *en masse*, with all its potentialities resident in the chaotic matter ; secondly, the work of distinction or division, of light from darkness, terra-firma from water, earth from air, inanimate matter from animate ; thirdly comes the work of adornment, to which appertains mention of the heavenly bodies and the various *grades* in the order of living forms.* Nevertheless, we cannot but be struck by the accuracy with which in the main the order of duration has been adhered to.

I need not, however, go over again what has already been treated when we considered the production of light, except to say that, in the case of most of the schoolmen, their science had not advanced upon, but retrograded from, that of Moses ; for they had borrowed from the Greek philosophers

* The question has been well drawn out by Alexander de Hales (in 2 P. q. 52. m. 1.).

their notions about the spheres, which they looked upon as huge wheels of incorruptible matter gyrating round the earth, in which the stars were fixed like jewels in a setting. Not all, however, adopted this puerile astronomy, nor did all hold that the heavenly bodies were composed of matter of a different nature to our earth, as Aquinas indicates in 1*a* LXX. 1 ad 1*um* et 3*um*.

I must conclude this part by a quotation from Alexander de Hales about the moon. In 2 p., q. 52, m. 5, he has :

" Nec mirandum Lunam appellatam esse luminare magnum, ut præesset nocti, etc." (Nor is it to be wondered at that the moon is called the great light which should rule the night. For although there are in the firmament luminaries which far exceed the moon in size, nevertheless, because none such so rule the night as the moon does by her shining upon the earth, because she is nearer to us than the rest, and consequently produces more and greater effects, fittingly, therefore, she is called by the name of the great light).*

We now come to the description of those living creatures which are capable of self-motion locally—that is to say, the power of moving themselves from place to place ; a power that is wanting to the plants, for which reason Aquinas holds that plant-life is

* I have throughout quoted Alexander de Hales (" Magister Alensis ") from Montefortino's " Summa," and on consulting the master himself, I find the sense accurately rendered, though the quotations are not always verbal.

relegated to that part of creation which has to do with distinction or division rather than with the work of adornment. This step in the progress of creation is thus described by the writer of Genesis :

" God also said : Let the waters bring forth the creeping creatures having life, and the fowl that may fly over the earth under the firmament of heaven. And God created the great whales, and every living and moving creature which the waters brought forth, according to their kind, and every winged fowl according to its kind."

It is worthy of notice that evolutionists hold that fishes, birds, and reptiles are very closely related by descent ; indeed, I believe it is held that all are derived from some common form. If this be true, the words of Genesis are indeed remarkable.

As with the plants, so with this new order of creatures, St. Augustine (in 5 Super Gen. ad Litt.) again applies his evolutionary doctrine about " rationes seminales," saying that they were not then actually produced in the perfect form in which we now see them, but virtually, in the power imparted to matter of producing aquatic, reptile, and bird-life. We must remember that Darwin holds that in the beginning life was breathed by the Creator into a few forms or one. It is possible, therefore, to conceive, according to St. Augustine's interpretation of Genesis, that a single form of plant-life, a single form of reptile and bird-life, and a single form of terrestrial animal life, were first created, each con-

taining the " rationes seminales " of all subsequent variations which branched off from those few forms. We might even extend this still further, and reduce all subsequent forms of life to one single primordial form. I say it is possible to conceive this without doing violence to the account of Genesis : I do not say that this is in the least proven—rather the weight of evidence seems strongly against it. But I am not dealing with the scientific truth or untruth of evolution ; I am merely showing that the theory receives countenance from Christian writers of the very highest reputation. Take these words of St. Thomas (1*a* LXXI. ad 4*um*) :

" Natura de uno extremo ad aliud transit per media," etc. (Nature passes from one extreme to another through mediums, and therefore between aerial and aquatic animals there are certain mediums which have something in common with both, and are reckoned amongst those with which they most communicate).

Or, again (*ibid.*, ad 5*um*) :

" In via generationis ab imperfectioribus ad perfectiora pervenitur " (In the way of generation the more perfect are arrived at through the less perfect).

How extraordinarily capable of an evolutionistic rendering are these utterances !

The account in Genesis of the work of creation continues :

" And God said : Let the earth bring forth the living creature in its kind, cattle and creeping things

and beasts of the earth, according to their kinds. And it was so done. And God made the beasts of the earth according to their kinds, and cattle, and every thing that creepeth on the earth after its kind."

Concerning the production of terrestrial animals St. Augustine maintains his position that when it is said " Let the earth produce," etc., we are to understand that to elemental matter was imparted the vital power of producing animal life. He holds that the account in Genesis should not be taken as representing the strict order of chronological succession, but that the different grades in creation are recorded step by step in an ascending scale of perfection. He maintains that all the latent energies, which should afterwards produce the various creatures, were implanted in primordial matter, but that the different forms came into actual existence in succession according as opportunity occurred—that is to say, according as the gradual development of the earth's surface gave them a foothold whereon they might maintain their subsistence.

The last to be mentioned in order of dignity is man himself, the apex of God's material works, in whom matter and spirit combine to form one composite being. It is thus spoken of :

" And He said : Let us make man to our image and likeness : and let him have dominion over the fishes of the sea, and the fowls of the air, and the beasts, and the whole earth, and every creeping

creature that moveth upon the earth. And God created man to His own image : to the image of God created He him : male and female created He them."

Commenting on this, St. Augustine (6 Super Gen. ad Litt., cap. viii.) tells us that these words of God are not to be supposed as uttered in audible accents, but in the thought of the Divine Mind, or, as he beautifully expresses it :

" In illa summa ejus Sapientia, per quam," etc. (In His own Supreme Wisdom, through which all things were made, not as though it [the voice] sounded in human ears, but as though it implanted in the things already made the causes of things that were to be made, and it made things about to be by its omnipotent power, and formed man, who in process of time was to appear, as it were in the seed or root of time).

Darwin could scarcely have expressed himself in more evolutionistic language.

The description of Creation in Genesis as interpreted by the best-accredited writers of the Church makes it abundantly clear that the process was a gradual one, and that the imperfect preceded the more perfect. It is not so manifest, however, that a higher species originated in one which was lower in the scale of organization, though, perhaps, reading through the lines, this might be understood from the account given. Indeed, it is not incompatible with a sound interpretation of Genesis. But the fact of

this—if it is a fact—remains for science to prove, and as yet science is far from having proved it. In truth, were it not for what seem to be rudimentary organs, and those instances in Nature which look like reversion to a former type, the plea for evolution would indeed be a lame one. A certain general unity of design does not in the least necessarily imply common descent, but it certainly does imply, under either hypothesis, the purposeful work of One Designer, in whatever way He effected His work.

I must leave the recapitulation of the process of Creation contained in the second chapter of Genesis to more learned commentators than myself ; but I have said enough to show that the principles of evolution at least had occurred to the thought of the early and medieval writers of the Christian Church.

Whether men, or rather, I should say, the " ape-like progenitors of men," existed before Adam is a matter concerning which theology at least need not trouble ; it is to be settled by the men of science, who at present seem decidedly at sea as to the time when man or man-like creatures first appeared upon the earth. That Adam is the progenitor of our human race—the race to which God united Himself by the Incarnation, and which, through the Incarnation, is elevated to a supernatural destiny—a Christian could not call in question. But as to how the body of Adam was formed from the slime of the earth, we have already seen that we cannot be alto-

gether certain. That the human body was fashioned anterior to the creation and infusion of the soul is, however, a conception not altogether foreign to the thought of the early Christian writers, as St. Thomas indicates (1*a* XCI. 4 ad 3) :

"Quidam intellexerunt," etc. (Some have held that the human body was first formed in the order of time, and that afterwards God infused the soul into the already formed body).*

Before proceeding farther, I must here pause to sum up what has gone before :

1. The principles upon which the theory of evolution is based were well known to those early and medieval thinkers who are justly reckoned as the greatest lights of the Christian Church, and though these principles were not fully reduced to the conclusions to which our modern evolutionists have reduced them, yet we have the strongest evidence that these conclusions dawned upon the minds of those illustrious doctors ; and had scientific research in their day gone as far as it has now, it is probable that some of them at least would have incorporated evolution unreservedly into their system of cosmogony.

* With regard to this matter, we must observe that the Biblical Commission at Rome lately published a decree (June 50, 1909) to the effect that the literal historical sense of Genesis concerning the special creation of the first man and the formation of the woman from the first man is to be adhered to.

2. Nevertheless, the conclusions of evolution are not necessary conclusions ; they are only probable conclusions of a greater or less weight. There are many signs in nature which appear to point that way, but, on the other hand, there are many signs which point just in the opposite direction. It would require a vast knowledge of facts, together with an immensely capacious and well-balanced intellect, to determine on which side the weight of probability most inclines, and, even so, further discoveries might reverse the decision. Variation, modification, adaptation within the limits of the same species is universally admitted to have taken place, but it has never been shown that one species has been evolved from another, and against this position arguments of tremendous force can be urged. Genetic evolution is not, and perhaps never can become, anything more than an hypothesis.

3. The account of Genesis, as interpreted by the best-accredited Christian commentators, goes to show that creation was a very gradual process, and the order observed in the narration is strongly evolutionistic. Nevertheless, the account does not necessarily imply the order of time, and that order appears to be set aside at least in one instance—namely, the formation of the heavenly bodies, and their appointment to their allotted work in the scheme of the universe. Furthermore, we are not to look for scientific exactitude in this account, for the inspired writer

had to suit his language to the rude intelligence of the semi-barbarous people to whom in the first instance he addressed himself.

4. The case being as stated, it follows that no one can compel our understandings to accept evolution, because he cannot demonstrate his hypothesis, and no individual authority outside revelation has sufficient weight to demand adherence to any doctrine without intrinsic proof. We will yield our reason to evidence, but to no authority short of Divine. On the other hand, if anyone pleases to adopt the hypothesis of evolution as the most probable, he need have no qualms as to faith, for whereas faith teaches us that God created all things, it teaches us very little as to the way in which the act of creation came forth from Him.

III

I MUST now pass on to the third and last part of my disquisition—namely, whether there is anything analogous to evolution in the development of dogma. This inquiry I will prelude by an extract from a letter of Mr. Chatterton Hill in the *Tablet* of March 18, 1908, in answer to some criticisms passed on his book, " Heredity and Selection in Sociology." He writes as follows :

" In conclusion, I would only say that I am sincerely glad to find the reviewer of a Catholic paper in agreement with the most fundamental doctrine of biological science—*i.e.*, that of the mutability and evolution of species. Whether this evoluton is due mainly to the intervention of selection or the transmission of acquired characters, to the gradual accumulation of vast numbers of individual variations, or the sudden development of new species by successive mutations, to the action of the climate, or to any other factor, is of secondary importance. The chief thing is that we should accept the great fact of evolution, with its inevitable corollary, that every variety is produced, developed, and eliminated by " iron mechanical laws," independently of any " vital force," arbitrary and irresponsible interventions, or any other mystical non-scientific principles. As long as this fact was denied, all discussion was *a priori* impossible between the Catholic and the

man of science. I am rejoiced to find an enlightened Catholic like your reviewer agreeing with that school of thought to which I belong, in acknowledging evolution as the great law of the organic world. I can only hope that eventually he will come to recognize the same fundamental law as also operative in the superorganic world, and admit the legitimacy of its application to the religious beliefs of humanity and other physiosocial phenomena."

The "inevitable corollary" alluded to in this extract will not appear so inevitable to the man of common sense who will keep his eyes open when he goes out of doors, or who will take the trouble to read Professor Windle's admirable little treatise, "What is Life?"

Moreover, no one pretends that natural processes are the result of "arbitrary interventions"; they are the result of law, and law implies a lawgiver.

Again, we are sometimes apt to be impatient with metaphysicians over their fine-drawn distinctions, but Mr. Chatterton Hill's arbitrary distinction between "Catholics and men of science" to anyone with an elementary knowledge of history is sufficient to stamp its originator as either a buffoon or a booby; without effort, there arise to remembrance the names of Cusa, Copernicus, Bacon, Stensen, and Mendel, not to mention a host of others, who were not only Catholics, but also ecclesiastics: yet they conferred considerably greater benefits upon science than anything we have ever heard recorded of Mr. Chatterton Hill.

These things, however, we will pass over, covering also with a veil of respectful silence the gratification of the "enlightened reviewer" at Mr. Hill's considerate condescension towards his mental ineptitude to grasp all that is within easy reach of Mr. Chatterton Hill's intellect. And we will confine our attention to the final clause, and see how far we ourselves as Christians may "admit the legitimacy of the application of the 'fundamental law' of evolution to the religious beliefs of humanity."

I must confine my attention to the development of the Christian religion, leaving other religions to speak for themselves. Yet it is worthy of note how many fundamental points all the great religions of the earth have in common. The notion of a Supreme Self-existent Being Who created all things, an after-life, the future reward of virtue and punishment of sin, expiation, self-denial in some form or other, sacrifice and prayer—such ideas are common to all religions of any note, and they point to some common origin. It requires more erudition than I possess to show how all this indicates one central religious system, in respect of which all others have more or less of truth in proportion as they more or less approach to the idea of this one religion. Moreover, this one central religion is a revelation communicated first to Adam, carried on through the patriarchs, through Moses and the prophets, and finally perfected by Jesus Christ our Lord and committed by

Him to the keeping of His Church. All other religious systems have so much of truth as they are found to be in agreement with the Church of Christ: where they diverge from the teaching of the Church they fall into error. Just as degrees in entity imply greater or less approximation to One Supreme Entity, so also degrees in religion (which is nothing else but the relation of other intelligent beings to this Supreme Entity) denote the existence of one perfect religion, which exhibits the relation which must subsist between man and his Creator during his earthly life-time.

As regards the Christian religion, we may divide it into two parts—the Old Testament and the New; for the Law and the Prophets were the harbingers of a fuller communication from God; they are always looking forward to something beyond, a *plus ultra* which finds its fulfilment in the Gospel of Jesus Christ.

We are speaking of revelation, not of the development of mere human thought, but of things which the mind of man could not reach by itself alone; therefore evolution in this case must come from above, although God makes use of human instruments for the imparting and for the conservation of the truths revealed to man.

We must first confine our attention to the Old Testament, and concerning this part of the Creator's dealings with His intelligent earthly creation—*i.e.*,

with man—there can be no doubt that revelation was conceded by steps ; this, if we please to do so, we may call " the evolution of revealed truth." St. Paul clearly indicates the gradual nature of God's supernatural dispensations towards mankind where he says (Eph. iii. 5) :

" The mystery of Christ, which in other generations was not known to the sons of men, as it is now revealed to His holy Apostles and prophets in the Spirit."

St. Thomas Aquinas has enlarged this idea for us with his wonted clearness and precision. In 2-2, I. 7 he explains that just as in a principle of reason innumerable inferior principles are contained, so in the principle that " God Is " are contained all the principles of revelation concerning the Divine Nature, as also in the principle that " God is the Rewarder of those that seek Him " are contained all the principles of revelation with regard to His dealings with mankind. Yet just as inferior principles of reason have to be deduced from a higher principle by the process of thought, so also the different truths of faith contained under these two universal principles have been given to man, not all at once, but by degrees. He concludes :

" Sic ergo dicendum est," etc. (Thus, therefore, we may say that, as regards the substance of the Articles of Faith, there has been made no successive increment, because whatsoever those that came after believed was contained in the faith of the fathers

who had gone before, although in an implicit manner. But as regards the unfolding of that faith, the number of articles has increased, inasmuch as certain points were explicitly known to those who came after which were known implicitly by former generations).

St. Thomas supports his arguments by texts from Holy Scripture, and by the authority of St. Gregory and Hugo de St. Victor. Moreover, in the same article (ad *2um*) he beautifully illustrates what I have said above—namely, that where revelation is spoken of, its very nature obliges us to consider the evolution of revealed truth as coming from above and not from below ; direct from the Spirit of God, not from the spirit of man, as in the progress we make in human science. These are the words of the Angelic Doctor :

" Ad secundum dicendum quod profectus cognitionis dupliciter contingit," etc. (We may say, in answer to the second question, that progress in knowledge takes place after a twofold manner—either on the side of the teacher who advances in knowledge successively from age to age, whether we speak of a single individual's life-time or of a succession of individuals (and this is the way of increment in the sciences subject to human invention), or else on the side of the learner ; just as the master who knows perfectly an art does not deliver the whole to his disciple all at once, because he could not take it in, but he does so little by little, condescending to the learner's capacity : after this manner men have made progress in revealed truth with the succession of ages. Wherefore the Apostle, writing to the Gala-

tians [chap. iii.], compares the condition of things in the Old Testament to boyhood).

It is just on this point that the Modernists have erred, whose initial fallacy consists in subjecting revealed knowledge to precisely the same conditions as natural knowledge.

It is, in fact, only necessary to peruse the Old Testament in order to become aware that such was God's dealings with mankind from the infancy of the human race. The central doctrine of our religion is the Incarnation of the Word, and it is quite clear that in the earlier books of Holy Scripture this is spoken of in veiled terms, a dim expectation of One Who was to come as the world's Deliverer ; each succeeding prophet adds something towards the right conception of the life and mission of the Messias. So extraordinary are these prophecies, so accurately and minutely are they fulfilled in the Person of Jesus Christ, that I find no stronger argument in favour of the truth of our religion than these wonderful predictions of the ancient seers.

Since the foundation of the Christian Church we find the same law of development operative in the evolution of Christian dogma, with, however, this fundamental difference : that in the Old Testament it was by the light granted to individual prophets that further manifestations of truth came ; in the Christian dispensation, however, the perfect gradual unfolding of the truth revealed by Christ was left

to the magisterium of the Church, who is the custodian of revelation, and to whom alone belongs the decision of questions of dogma whensoever occasion may arise. Individuals, indeed, have played their part in this work, but it is the Church which gives the ultimate seal of her approbation.* This is the view held by St. Thomas and Duns Scotus, which was drawn out by Cardinal Newman in his book, "The Development of Christian Doctrine," a book which has been turned with such ingenious sophistry to bad account by Modernist writers misinterpreting the mind of the great Cardinal, whose openly professed life's mission was precisely to combat the enemies of dogmatic Christianity, and who, being dead, was unable to explain his words for himself.

A dogmatic definition nearly always results from the rise of some heresy. Ideas, and consequently language, on some more recondite point of faith are at first somewhat indeterminate and confused. Gradually two schools of thought are formed, which,

* Prophetic inspiration did not cease with the foundation of the Church, but the office of the Christian prophet is not to declare some new point of revelation, but rather, as St. Thomas says (2-2. CLXXIV. 6.), to edify the faithful and direct them in particular actions. The revelations of the saints were useful to themselves for the profit of their own souls, and in like manner they edify us, but they have not the weight of infallibility behind them, and sometimes we detect incongruities and contradictions where the human spirit has impaired clearness of vision.

coming in conflict one with another, receive sharper outline, for " Contrarium alio contrario superveniente vehementius agit " ; at length the Church, under the guidance of the Holy Spirit, places upon the truth the seal of her authority, and the opposing party must either make its intellectual submission, or remain outside the Church as a sect of heretics. It is a real case of struggle for existence between opinions, in which struggle the stronger by virtue of its truth, must ultimately prevail, according to Our Lord's promise to His Church. St. Thomas describes this admirably in the preface to his " Opusculum Contra Græcos " :

" Quod autem," etc. (That certain things in the sayings of the Greek Fathers are found which to moderns might appear dubious I attribute to two causes : First, because the rise of heresies gave occasion to the Doctors of the Church to speak with greater circumspection concerning points of faith, in order to eliminate the nascent heresies, as it is evident that the Doctors, prior to the error of Arius, did not speak with such exactitude about the unity of the Divine Essence as did those who came after him ; and the same happened with regard to other errors, which is clearly manifest, not only in different Doctors, but in that one most excellent Doctor, Augustine. For in the books he wrote after the rise of the Pelagian heresy he spoke much more cautiously about the freedom of the will than he did in those books which he wrote anterior to the rise of that heresy, in which books, while defending the freedom of the will against the Manichæans, he uttered some things which the Pelagians took up in defence of

their error against Divine Grace.* Therefore it is not to be wondered at if modern Doctors of the faith, after the many heresies which have arisen, speak with more caution and greater exactitude about doctrines of faith, for the avoidance of all heresies. Wherefore, if some things are found in the sayings of the ancient Doctors which are wanting in that cautious accuracy which the moderns observe, they are not to be spurned and rejected ; neither should they be amplified, but reverently explained).

He expresses the same thought elsewhere even more clearly still (1*a* XXXII. 4 c.) with regard to matters indirectly connected with articles of faith. The passage is worth quoting, though it does not bear so forcibly upon the point at issue :

" Ad fidem, pertinet aliquid dupliciter," etc. (A thing may appertain to faith in a twofold manner : in one way directly, as those things which are principally revealed to us by God, such as God being Three and One, the Son of God having become incarnate, and matters of this sort, concerning which a false opinion at once implies heresy, especially if it be pertinaciously maintained. Indirectly, however, those things appertain to faith, from the denial of which something contrary to faith follows—as, for example, if anyone said that Samuel was not the son of Helcana ; for from this it follows that the Holy Scripture is untrue. Concerning things of this sort, therefore, anyone may hold a false opinion without heresy before it has been considered or determined that from it follows something contrary to faith, especially if it is not maintained with per-

* Augustine had the good fortune, which was denied to Newman, of being able to state his own case for himself.

tinacity; but after it has become manifest, and especially if it has been laid down by the Church, that from this follows something contrary to faith—to err in this would not be free from heresy. For this reason many things are now held heretical which before were not thought so, because now has become more manifest what follows from them).

He speaks in the same manner in *1a* XXXVI. 2 ad 2:

"In quolibet concilio," etc. (In each council a creed was framed to combat some rising heresy condemned by that council, so that the later council did not compose a creed different from that of the preceding council, but amplified by certain additions what was implicitly contained in the former council, the more clearly to brand the nascent heresy).

This quotation is perfectly adapted to illustrate our point. There can therefore be no doubt as to the mind of St. Thomas that revelation is progressive, not as regards substance, but as regards more exact expression.

Scotus, the great compeer, and not infrequently the rival and opponent of St. Thomas, is here at one with the master in holding that the substance of revelation, remaining always one and the same, forms, as it were, the germ from which, in process of time, by the action of the Holy Spirit in His Church, the full and perfect tree of Christian dogma is gradually developed. Having spoken of the immutable substance of revelation, he continues:

" Veruntamen quia hominum tenui capacitati," etc. (Nevertheless, because it was not opportune to propose all matters of belief at once to the weak capacity of man's understanding, most wisely were made known to the Church the things successively to be revealed and propounded for the belief of the faithful. For since the Church is guided by the Spirit of Truth, the Scriptures are opportunely expounded under the direction and guidance of the selfsame Spirit by Whom they were written, and the truths wrapped up in them are unfolded and explicitly proposed for our belief. Hence, besides those things explicitly contained in the Apostle's, Athanasian, and Nicene Creeds, many other things were proclaimed by the Lateran Council under Innocent III. as belonging to the truth of faith, and as being of its substance to be therefore firmly believed " (" De Montefortino Sum. Scot.," 2-2, I. 7).*

Howsoever Modernists may have misinterpreted Newman, it is apparent to anyone conversant with scholastic theology that he has but faithfully reduced to their legitimate conclusions the premisses laid down by Scotus and St. Thomas Aquinas, illustrating by numerous examples this " explicatio " or gradual unfolding of the truths implicitly contained in the substance of revelation from the beginning. Just as many heretics from Pelagius to Luther and Calvin endeavoured to draw St. Augustine on to their side, so Modernists have acted with Newman.

* The " Scotist Summa," compiled by Montefortino, is a priceless work, by the aid of which one is enabled to compare side by side the teachings of the great Scotus with those of the still greater Aquinas.

In the " Apologia " Newman says of his " Essay on Doctrinal Development " : " I have no doubt at all that I have made many mistakes in it." No doubt there are mistakes, but they are not very easy to discover. It is a wonderful book, the history of his own mental development re-enacting the development of the Christian idea in the Church herself, as the embryo is said to re-enact the development of the species to which it belongs. The same Almighty Spirit guided the development of Newman's individual and fallible mind who guided the collective and infallible mind of the Church. We are only just beginning to get the right perspective of Newman ; his is a figure which does not grow less by distance ; his influence is no more merely local and temporary than was St. Augustine's. Although, like Augustine, the exercise of Newman's mighty intelligence was called forth by the controversies of his own time and country, yet Newman, too, was a world-mover, and his influence on the thought of the Church grows and spreads continually, and will go on to grow and spread.

It is curious to note that at the very time when Newman was conceiving his idea of the Development of Doctrine, Darwin was simultaneously engaged in making those famous observations which resulted in " The Origin of Species." Newman's book actually saw the light of day some years anterior to that of Darwin ; to him, therefore, belongs the

honour of the pioneer. Men's minds in general must have been for a long time slowly veering round from the idea of abrupt changes to that of gradual growth ere two individual minds could have severally applied similar principles to different subject matters. It is not original thought only which gives to a genius his standing, but it may also be the fact that he gathers together the drift of thought which is occupying a multitude of minds, and gives to it expression.

Evolution was without doubt in the air, and Newman, in marking off his boundaries, expressly says :

" Nor, of course, do physical developments, as the growth of animal or vegetable nature, come into consideration here, excepting that, together with mathematical, they may be taken as illustrations of the general subject to which we have to direct our attention."

These illustrations, however, are of immense value, because the more we study them the more do we see what I have elsewhere over and over again insisted on—namely, the unity of plan discernible in the works of Nature and of Grace, showing us so clearly that both have one Author, and that both were intended to harmonize with one another. On this point I will fortify my own feeble conceptions by a quotation from the Angel of the Schools (2-2, I. 7 ad 3).

"Ad tertium dicendum," etc. (In answer to the third difficulty, it may be said that for natural generation two causes are requisite—the active agent and the actuable matter. Therefore, according to the order of the active cause, naturally first is that which is more perfect; and, thus speaking, nature takes its beginning from the perfect, because the imperfect cannot be brought to perfection except by something perfect already pre-existent. But, according to the order of the material cause, first is that which is less perfect; and, thus speaking, nature proceeds from the imperfect to the perfect. So, in the manifestation of revealed truth, God is in the place of the active agent, Who possesses perfect knowledge from eternity; but man is, as it were, the actuable matter, which receives the influx of God's action; and therefore it behoved that the knowledge of revealed truth amongst men should proceed from the imperfect to the perfect; and although amongst men some have been in the position of actuators—those, namely, who were teachers of the faith—nevertheless, the manifestation of the Spirit was given to such for the common good, as is said in 1 Cor. xii.; and therefore so much supernatural knowledge was granted to the Fathers, who were instructors in the faith, as was fitting for the time to be delivered to the people either openly or by symbols).

This is magnificent: St. Thomas draws an analogy between natural and supernatural fecundation, and shows how both, having one and the same Author, proceed on similar lines. After all, what could we expect but to find this uniformity, this unity of plan, since nature and grace are both from God, and are

both meant to go hand in hand. The workings of many minds in the attainment of truth are the counterpart of the workings of the individual mind. For, as St. Thomas says (1*a* XIV., 6 c.), the intellect first arrives at a confused and general notion of anything, and then, progressing from the imperfect to the perfect, it gains a proper and specialized grasp of its object.

Not even St. Thomas had so comprehensive a grasp of the evolution of doctrinal developments as had Newman; and on broad general lines how strangely like it is to the Evolution of Darwin, the same conception applied to different subject-matters! This is indeed striking and worthy of note, but what is of more importance to us is that Newman's teaching is nothing but a development—a legitimate development—of the teaching of the two greatest lights of the Medieval Church, and these, on their part, as does Newman also, cite the authority of the earlier Fathers to corroborate their teaching. I will show both points by a few quotations from those initial parts of the work wherein Newman propounds his hypothesis, leaving alone the application he has given it in the history of different dogmas, which part of the work is rather polemical than philosophical; but, indeed, the book itself will amply repay perusal and reperusal. Just as Darwin speaks of his *theory* of evolution, so does Newman speak of his *theory* of development; neither claims

more than hypothesis for his idea. He looks upon change as the necessary manifestation of life: "Here below to live is to change, and to be perfect is to have changed often" (chap. i., sect. i. *in fine*). This change, however, does not mean the loss of what has gone before, but its amplification: there is a change which is corruption, and a change which is legitimate development, and he lays down with marvellous skill seven rules by which a true development may be discerned from a corruption. They are:

1. Preservation of its type.
2. Continuity of its principles.
3. Its power of assimilation.
4. Its logical sequence.
5. Anticipation of its future.
6. Conservative action upon its past.
7. Its chronic vigour.

As the guiding principle which maintains the development of a revealed doctrine true to type, Newman shows the necessity of an infallible "developing authority."

All this, therefore, he looks upon, not as any matter of blind chance—for to the Supreme Cause there is no such thing as chance—but as the exhibition of law:

"It is maintained in this Essay that, granting that some large variations of teaching do, in its long course of 1,800 years, exist, nevertheless, these, on examination, will be found to arise from the nature of the case, and to proceed on a law, and with a

harmony and a definite drift, and with an analogy to Scripture revelations, which, instead of telling to their disadvantage, actually constitute an argument in their favour, as witnessing to a superintending Providence and a great Design in the mode and in the circumstance of their occurrence " (Preface to edition of 1878).

These variations*

" manifest themselves on a law, not abruptly, but by a growth which has persevered up to this time without any sign of its coming to an end " (Introduction).

This is necessarily so, for

" from the nature of the human mind time is necessary for the full comprehension and perfection of great ideas, and that the highest and most wonderful truths, *though communicated to the world once for all by inspired teachers*, could not be comprehended all at once by the recipients, but, as being received and transmitted by minds not inspired, and through media which were human, have required only the longer time and deeper thought for their full elucidation " (*ibid.*).

Again :

" It is not that first one truth is told and then another, but the whole truth, or large portions of it, are told at once, yet only in their rudiments or in miniature, and they are expanded and finished in their parts as the course of revelation proceeds " (chap. ii., sect. i., m. 9).

* The word " variations " is not very well applied, and we think Cardinal Newman might have expressed his idea by an apter term.

How exact a reproduction is this of the doctrine of St. Thomas quoted above! The final triumph, however, of the true development is not won without a fierce struggle against corrupting influences:

"It is elicited and expanded by trial and battles into perfection and supremacy" (chap. i., sect. i., *circa finem*).

These corrupting influences are

"ejected by the gradual growth of the stronger" (chap. i., sect. ii., m. 3). "The refutation and remedy of errors cannot precede their rise, and thus the fact of false developments or corruptions involves the correspondent manifestation of true ones" (chap. ii., sect. i., m. 3).

There is here quite a Darwinian conception of a great idea's struggle for existence. What, according to Darwin, natural selection performs in the evolution of species, that we may say is performed by supernatural selection, the guidance of the Holy Ghost, in the evolution of Christian dogma. Men may and do from time to time arise in the Church "speaking perverse things," but we have it upon Divine warrant that the truth shall ultimately prevail, that the foundations of revealed truth may be shaken, but cannot be removed. To give, however, an adequate notion of a great idea battling for its existence against surrounding corruptions, I must quote at some length Newman's own inimitable description:

" Let one such idea get possession of the popular mind, or the mind of any portion of the community, and it is not difficult to understand what will be the result. At first men will not fully realize what it is that moves them, and will express and explain themselves inadequately. There will be a general agitation of thought, and an action of mind upon mind. There will be a time of confusion, when conceptions and misconceptions are in conflict, and it is uncertain whether anything is to come of the idea at all, or which view of it is to get the start of the others. New lights will be brought to bear upon the original statements of the doctrine put forward, judgments and aspects will accumulate. After a while some definite teaching emerges, and as time proceeds one view will be modified by another, and these combined with a third, till the idea to which these various aspects belong will be to each mind separately what at first it was only to all together. It will be surveyed, too, in its relation to other doctrines or facts, to other natural laws or established customs, to the varying circumstances of times and places, to other religions, politics, philosophies, as the case may be. How it stands affected towards other systems, how it affects them, how far it may be made to combine with them, how far it tolerates them, when it interferes with them, will be gradually wrought out. It will be interrogated and criticized by enemies and defended by well-wishers. The multitude of opinions formed concerning it in these respects and many others will be collected, compared, sorted, sifted, selected, rejected, gradually attached to it, separated from it in the minds of individuals and of the community. It will in proportion to its native vigour and subtlety introduce itself into the framework and details of social life, changing public opinion, and strengthen-

ing or undermining the foundations of established order. Thus in time it will have grown into an ethical code, or into a system of government, or into a theology, or into a ritual, according to its capabilities, and this body of thought, thus laboriously gained, will after all be little more than the proper representative of one idea, *being in substance what that idea meant from the first*, its complete image as seen in a combination of diversified aspects, with the suggestions and corrections of many minds and the illustrations of many experiences" (chap. i., sect. i., m. 4).

To quote only one instance, how perfectly does this description exhibit the conflict which the idea of evolution itself has gone through and is still going through!

Newman's doctrine is undoubtedly a kind of "evolution," yet Newman's doctrine is the necessary outcome of the doctrine of the scholastics, as theirs is the necessary outcome of the doctrine of the Fathers.

I must now sum up and close. In no sense is evolution at present more than an hypothesis. Neither Newman nor Darwin claimed for their respective but similar theories anything higher than probability. Both these great men have been misrepresented and distorted by a bastard progeny—Newman by the Modernists, Darwin by the Materialists. The Modernists strove to reduce supernatural action to the level of natural action; the Materialists endeavoured to eliminate the Creator

altogether, to reduce every manifestation of energy, material, vital, or intelligent, to the operation of iron mechanical laws. They attribute thought and will to the inanimate atom as well as to the human intelligence. With them it is a question only of degree, not of kind, and we must confess with sorrow that there are certain parts of Darwin's theory which countenance this absurdity, and of which it is the logical outcome. In Newman's theory I cannot, however, find anything which, properly understood, would give the least handle to Modernism. But because a theory has been mischievously distorted, are we therefore to condemn it root and branch ? I do not think so. It would be almost as reasonable to condemn Christianity because it had scarcely made its appearance ere it began to throw off poison in the shape of heresies.

We have seen, moreover, that the principles of evolution are deep-rooted in the sanest of all philosophies. But as to the application, the unfolding of those principles in the different subject-matters upon which they bear, as yet very little has been definitely determined. We must look to the expert naturalist and to the profound student of the history of Christian dogma to throw further light upon our path as regards these two questions of evolution. Darwin was one of the greatest of naturalists, Newman a patristic scholar with few parallels. We must leave the expert to do an expert's work.

Nevertheless, keeping to my own standing-ground, I may be permitted to say that I perceive nothing impossible in evolution or that contradicts the principles of sound metaphysics. Indeed, if we are to judge by analogy from the things within our horizon to those outside its bounds, certainly it does seem an almost universal law in creation that all things proceed from the imperfect to the perfect, from the rudiment to adult proportions. Evolution is a term capable of many different meanings, but if this process of gradual development is really a universal law, this is in some sense or other evolution, though precisely upon what lines the process has been conducted we are as yet far from knowing, and perhaps shall never know.

One thing, however, is certain—the idea of evolution has entered deeply into our thought, and its terminology taken a firm possession of our language. It looks as if it had come to stay. Of this idea, at least, we need not be afraid. It goes counter to no sound principle of reason or faith. It is an enlargement, not a corruption, and we may at least hope that when it has received its proper adjustment, when mistakes and errors have been sifted from truth, we shall find that after all it has added something of permanent value to our philosophy.

APPENDIX

In speaking of the *prima facie* likeness between the "idea" or "concept," and the "common phantom," Father Clarke thus expresses himself: "There is just enough similarity to make the attempt to identify them a plausible one. It is scarcely too much to say that, as in the nobler animals, there is something which is a sort of shadow of reason, and so nearly resembles reason that the *a posteriori* observer cannot discern any wide distinction between the intelligence of the dog and the intellect of the savage; in the same way the 'common phantasm' is so respectable an imitation of the 'concept,' that we can scarcely wonder that those who do not start from the solid foundation of philosophic truth have regarded the two images as identical" ("Logic," chap. vi., p. 113, Stonyhurst Series).

I quite agree with Father Clarke, though in doing so I shall appear to contradict what I said in my pamphlet on "Reason and Instinct." Therein I said that the difference between the two was clearly marked, while here I appear to admit the contrary. The fact is, I had a correspondence on the subject with a man of high intellect, aad I found that what to me was as clear as daylight to him was most

obscure. Yet in all practical matters he was a man far cleverer than myself. I suppose it was a case of "ubi intenderis ibi ingenium valet." He had given himself to practical things, and I had given myself to things speculative. We were each superior to one another in our own special sphere. I answered him: The distinction between Reason and Instinct is clear enough speculatively, but it is hard of discernment in practice unless we pay strict attention to the *principle of action* in each case—namely, intelligent and universal in the case of reason, sensitive and particular in the case of instinct. Consciously to apply means to an end is not alone a sufficient proof of reasonable action, for that consciousness may be merely sensitive consciousness. Let a person consider what he would aim at in teaching a dog not to steal, and what he would aim at in teaching a child not to steal. In the case of the dog it would go no higher than to impress upon its sensitive nature that theft is contrary to its master's will—no more than this; in the case of the child it would be to induce in its intelligence universal notions of honesty and dishonesty, and these would be collocated under the still more universal notions of right and wrong. If we consider this example, we shall see the distinction plainly enough; yet in everyday speech we often improperly apply the terms of reason to the action of instinct, as Aquinas points out ("De Ver.," xv. 1 c.):

"Interdum ipsa vis cogitativa, quæ est potentia animæ sensitivæ, ratio dicitur, quia *confert inter*

formas individuales sicut ratio proprie dicta inter formas universales" (Sometimes that faculty of comparison and inference, which is a power of the sensitive soul, is called reason, because it associates individual images, just as reason properly so called associates universal ideas).

The distinction is drawn out with marvellous insight by Aristotle in " De Anima," III.

My correspondent, however, was not satisfied with this. He said he was not sure that the methods one is forced to adopt in training a dog were not quite as much the result of our own limitations as those of the dog. To this I can only reply that we can but act to the best of our judgment and power; that the human intellect, though it has its limitations, is yet a marvellous endowment; and that, according to the wisest of the Greek philosophers, whose reasoned conclusion is supported by the authority of our own great Francis Bacon, the proper and proportionate object of the human intellect is the nature of material things which the intellect abstracts from sensible objects (" De Anima," III. viii.). We judge of a dog's nature by its actions, and those actions teach us that it would be mere waste of time to endeavour to instil into it ethical notions.

He went on to say : " I doubt whether it is possible either to prove or disprove the possession of reason by animals. Is it purely sensitive consciousness that teaches a beaver how to make a dam or a swallow its nest ?"

To these further queries of my correspondent I replied as follows :

1. Our intellect is not of the intuitive order, so that we cannot see directly into the natures of things, and thus solve the question once for all.

2. The animals have no intelligent means of conveying to us their innermost self—*i.e.*, the means of speech (from which deficiency, indeed, I might draw another cogent argument). As Darwin himself (" Descent of Man," chap. iii.) most justly remarks, our difficulty about determining how far animals exhibit any traces of the higher mental qualities " arises from the impossibility of judging what passes through the mind of an animal." That is true enough, but from a pure negative we can neither draw arguments for nor against a position. We can only use the data that we have got—namely, observation of the animal's actions. Once again to quote Darwin (*loc. cit.*) :

" We can only judge by the circumstances under which actions are performed whether they are due to instinct, or to reason, or to the mere association of ideas. This latter principle, however, is intimately connected with reason."

As I have observed in my former pamphlets, Darwin confuses " ideas " and " images." The association of ideas produces reason, properly speaking; the association of images produces " ratio particularis," or sensitive inference, which can only be called reason analogically.

We must therefore exclude (1) and (2) from our possible sources of knowledge.

3. The only thing left to us is to judge of their nature by the actions they elicit, amongst which we can find nothing which surpasses the limits of sense.

This was my line of argument—that they give no indications by which we can *prove* their possession of reason. I would, however, go further than this, and say that we can disprove it, if not to demonstration, at least almost to demonstration. Indeed, as far as I myself am concerned, the arguments do seem to me to conclude with demonstrative evidence. To do this I should take just such examples as those which my correspondent adduces *in contrarium*. I should argue thus :

1. Wonderful as the operations of the beaver are, still, they are tied down to one thing—*i.e.*, the building of his little hut and his dam. His powers are determined to a particular end. Far otherwise the human architect and engineer. He is a practical mathematician, working from the universal principles of mathematics. He can construct buildings, dams, bridges, canals, anything in the way of material works, and he can vary his designs without end. The difference arises from the *principle of action*, sense limited to what is individual and particular, intellect ranging over the whole field contained under the universal it has apprehended.

2. The beaver requires no schooling, but the human surveyor, architect, or engineer must spend many years in learning his principles. The beaver

at once selects the spot most fitted for his dam; the engineer must spend much time surveying and calculating before he can apply his principles to the best advantage. The beaver knows intuitively what strength his dam requires; the engineer must laboriously compute the proportion between the weight of water and the resisting power of his dam. In other words, the beaver is born an engineer, the man must be made such.

3. In its own order, instinct turns out better work than reason. With the same limitations as to material, could a human engineer construct as good a dam as does the beaver? I doubt it. I suppose that if a man were to try for a lifetime, at the end he could not construct a swallow's nest so perfect as this year's fledgling will build next summer. Take again, for example, what Darwin says ("Origin of Species," chap. vii.) about the cell-making instinct of the hive-bee, or what Professor Windle, in his admirable book, "What is Life?" quotes from Carpenter concerning the "tests" of the foraminifera. If these creatures act by reason, then it is superlative reason, for they turn out better work in their own line than any man could do. We ask, Why do they not exhibit it in other ways? Why are they tied down to one particular line of action? Indeed, Darwin's perfectly beautiful chapter on "Instinct" is more strongly in support of my contention than anything else I have ever read. Let the reader consult it for himself. Darwin's theory, of course, obliges him to suppose that these instincts have

been evolved, and he shows the possible transition from the rude cell of the humble-bee, through the better-constructed comb of the Mexican melipona, to the unsurpassable perfection of the hive-bee's work, which has "practically solved a recondite problem of mathematics," the cells being so constructed "as to hold the greatest possible amount of honey with the least possible consumption of precious wax."* We can no doubt easily imagine this, but it is superfluous to say that there is not the faintest proof that such a transition ever took place.

Reason proceeds painfully by experiments and many failures, and in the end succeeds in producing what at best is but a poor copy of Nature's handiwork, which Nature performs with no schooling and with scarcely an effort. Can we weigh all this without being assured that Nature is acting under the guidance of an Intelligence infinitely superior to reason? It matters nothing upon what lines that Intelligence is working, whether by the process of "natural selection" or otherwise; still, it is Intelligence infinite and uncontrolled. This Intelligence has impressed upon the imagination of the brute certain "working forms" according to which it performs its operations, yet they are evidently impressed upon sensitive imagination, not upon intellect, because they are tied down to the production of a certain determinate particular work, whereas

* If, then, the hive-bee is endowed with reason, the little creature should be ranked, not with a rustic, but with a senior-wrangler of Cambridge.

intellectual forms, by reason of their universality, contain under them limitless kinds and varieties of possible construction.

If anyone will peruse for himself Darwin's remarks on this head in the " Descent of Man," he will see that Darwin has made the mistake so common amongst modern philosophers of confusing the " common phantasm " with the " idea." The " common phantasm " has, indeed, a certain universality, but it is the universality of mere vagueness. For example, when anyone speaks of a triangle, immediately in my fancy there rises up a dim, ill-defined image of a triangular figure of some sort, or rather of no definite sort ; if I focus my imagination to bring the image out clear, at once and of necessity it assumes definite shape, and becomes something quite individual. It is that one thing, and nothing else. But my " idea " of a triangle is always clear-cut and definite. It is the same in the mind of every geometrician ; it is absolutely universal, and though triangles are of various kinds, and each kind is capable of infinite dimensional diversity, yet the *idea* of a triangle is the same in all and each. We express this idea by the definition, " a triangle is a plain figure enclosed by three straight lines, and having its three interior angles equal to two right angles." It does not actually exist in Nature, for Nature knows no perfect plane and no perfect angle, because matter is not capable of receiving it perfectly. It is, in fine, purely a mental abstraction.

This power of the human soul to soar above matter

affords us an irrefragable proof that the soul is itself immaterial, and it is from this, as from a centre, that all other arguments for the immortality of the human soul branch out. They are all in some way reducible to this. Brute action, however, gives evidence of no such power. The brute animals are quite capable of exercising " ratio particularis "—*i.e.*, inference from individual forms, which depends upon the " vis æstimativa " or " vis cogitativa," as it is called in scholastic philosophy, the two different titles expressing the same thing, with this distinction : that the " vis æstimativa " of the brutes stands by itself alone, and deals with individual forms, while the " vis cogitativa " in men acts under the control of the higher reason, which deals with universal forms. The distinction is beautifully drawn out by St. Thomas in 1*a* LXXVIII., 4 c.; 1*a* LXXXI., 3 c. ; 1*a* XCVI., 1 c. ; 1-2 XXX., 3 ad 8 ; 1-2 LXXIV., 3 ad 1. If anyone will take the trouble to consult these places, he will see the whole question clearly enough, nor can he fail to be seized with admiration for the lucid profundity of the thought of Aristotle and his great exponent Aquinas.

By way of example, if your dog has a thorn in his foot, he will come limping and whining to you, his master, and will hold up his foot in mute appeal for assistance. His sensitive powers of inference have put two and two together—his own individual discomfort with yourself, his personal benefactor—and he has arrived at the particular conclusion that you can and will help him.

If you yourself have a pain, you will act in very much the same way, and come to a very similar conclusion, only your principle of action will be different. You will proceed from a universal thus :

Those who are skilled in an art are to be consulted.

Doctors are skilled in the healing art.

I will consult a doctor.

This is a very rough syllogism, but sufficient to illustrate my meaning. Your major is a universal proposition, your minor is also a universal, though subordinate to the major, because less extensive ; your conclusion is particular. But though your conclusion is particular, it is yet vague, and not sufficiently individualized. It is the "individuum vagum," the "common phantasm." You must focus it in order to bring out a definite image. This you will do thus :

I will consult a doctor.

Smith is a doctor.

I will consult Smith.

You have now got out of the region of the abstract, and descended to the concrete. You now put your conclusion to a practical issue by going and consulting Smith. You see here a wonderful analogy between your own mental process and that of your dog. The only difference was in the principles from which you started, yours being universal and his particular, because you have, besides your sensitive powers, also a spiritual mind capable of soaring above matter, and he has only a material mind, which cannot get above the concrete—at least, no

higher than the vague, ill-defined " common phantasm."

No one ought to have any *a priori* bias against this reasoning. It is not peculiar to Roman Catholicism nor even to Christianity: it is simply heathen philosophy, which went just about as high as uninspired wisdom could go. It is no word-spinning or hair-splitting; it is the everlasting philosophy which goes deep down into the heart of Nature.

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THE END

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